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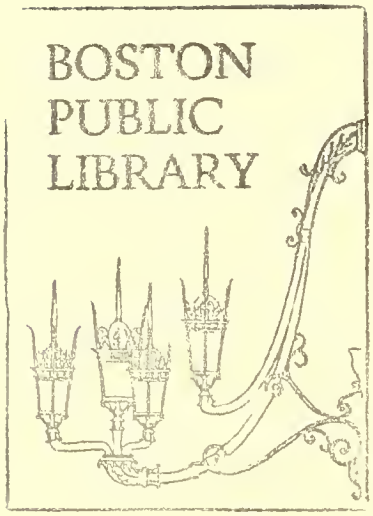
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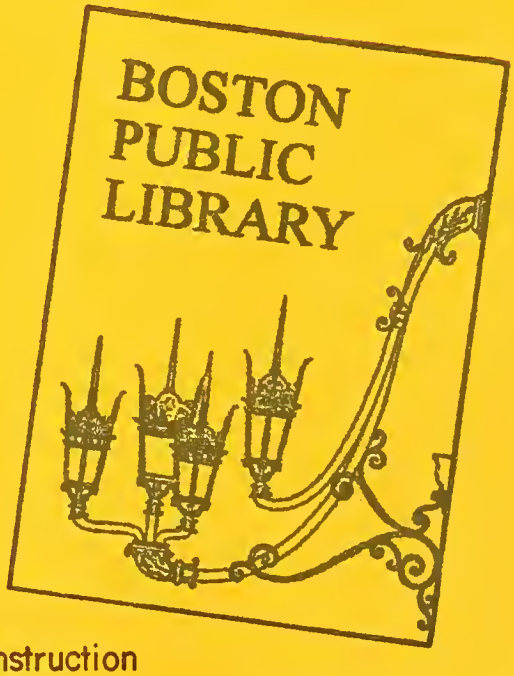
SUPPLEMENTARY
STAFF REPORT

BIND

CHARACTERISTICS OF REGIONAL TRAVEL



prepared by
The Central Transportation Planning Staff
for
The Executive Office of Transportation and Construction
for inclusion in the 1976 Program for Mass Transportation

September, 1976

The Commonwealth of Massachusetts
Executive Office of Transportation & Construction
One Ashburton Place
Boston, Massachusetts 02108

FREDERICK P. SALVUCCI
SECRETARY

September 27, 1976

TO: Ms. Carla B. Johnston, Staff Director
Advisory Board to the MBTA

FROM: Matthew A. Coogan
Director of MBTA Systems Planning

RE: Transmittal of Supplementary Staff Report

I am pleased to transmit at this time a draft report entitled "Characteristics of Regional Travel," prepared by the Central Transportation Planning Staff for inclusion in the Technical Supplement to the Revised Program for Mass Transportation. The report was prepared by Mr. Allen Simon and other CTPS staff members. We are now circulating this draft document to all of those on the PMT staff report mailing list.

The draft was created in direct response to the requests of the Committee made during the ten workshops, and articulated in several memos from you to EOTC. The new document presents basic data concerning: the relationship between radial (inward), circumferential, outward, and internal movements for 41 new analysis zones; standardized demographic descriptions of all of the 79 cities and towns in the MBTA region; travel to and from Cambridge, reverse commutation out from the core; and, detailed descriptions of travel flows to and from the CBD and the rest of the core.

The pages of this report will be utilized in the "Regional Context" Section of the Technical Supplement to the PMT, within each of the corridor chapters. We would appreciate any comments or corrections concerning this material, so that they may be incorporated into the Draft PMT documents themselves.

We are working towards distribution of the PMT within the next three weeks, with distribution of the Technical Supplement immediately thereafter. This schedule, of course, calls for a very intensive review period during October and early November. This would allow a formal Submission by December 1, and a final vote by the year's end.

MAC/lad

SUMMARY

Supplementary Report, "Characteristics of Regional Travel

This report was prepared for inclusion in the technical supplement to the Program for Mass Transportation, being prepared by BOTC. This supplemental report is a direct response to requests made by the Transit Development Committee of the MBTA Advisory Board for more detailed information regarding travel patterns within the region, especially for non-radial travel.

The report presents demographic information, a summary of transportation services available, and travel patterns for each of 41 zones within the MBTA region. The Zone boundaries, were selected to include areas with similar travel characteristics, while demonstrating the relative importance of travel direction from the zone.

The report shows that for zones within Route 128, the most important single morning peak period travel direction is inward, to or toward the regional core. These trips typically represent 30 to 45 percent of all peak period trips from these zones during the peak period. For zones farther from the core (outside Route 128), the regional core is an important destination, but does not dominate as it does for inner zones. Typically, core-bound trips represent 10 to 25 per cent of trips originating outside Route 128.

The report illustrates that a large percentage of trips originating within a zone also end within that zone (internal trips). This percentage is larger for the outside zones (which are larger zones, in terms of area) than it is for the inner areas, showing that the dominating effect of the regional core drops off as the distance from downtown Boston increases. Circumferential trips (trips to zones approximately the same distance from the core) are also shown to be significant from all zones, but destinations are spread over a much larger area than they are for other trip categories.

The report also details the patterns of trips into selected zones in Boston and Cambridge from the rest of the region. This analysis shows that the regional core attracts trips from all over the region, with the South Shore showing the greatest number of trips into the core. Trips into Cambridge, on the other hand, come chiefly from the Northwest and the North. Other important destinations within Route 128 include Lynn, Quincy/ Milton, Newton and Waltham, each with over 30,000 peak period trips.

The supplementary report presents information on travel patterns which has not previously been available in a form which can be used by persons outside the transportation planning agencies. Hopefully, it presents this travel data in a way which will aid the Advisory Board, JRTC, and other review agencies to their evaluations of transit plans and programs.

TABLE OF CONTENTS

Title	Page
Introduction	3
Travel Information to Be Presented in this Supplement	3
Subdivision of Eastern Massachusetts into Zones	5
Definitions of Categories of Directional Travel	6
The Core	8
Portions of Boston Outside of the Core	14
Cambridge	19
Zones in Region Other than Boston and Cambridge	24
Morning Peak Period Travel to Zones Within Route 128	83
Appendix I - Adjustment of Mode Split Estimates	85

1976 PMT

CONSOLIDATED ZONES USED IN TECHNICAL SUPPLEMENT

5 Miles

Figure: 1

Introduction

Regional travel information was presented in the Revised Program for Mass Transportation--Staff Report #1. The information included Boston CBD and core-oriented travel form 14 zones comprising Eastern Massachusetts. It was suggested by the MBTA Advisory Board that more detailed travel information would be desirable. It was suggested that a finer breakdown of the region than 14 zones was worthwhile. Information on travel that is not core-oriented was requested by the Board. The purpose of these requests was to identify suburban-oriented, circumferential, and reverse commuter travel markets and to gain some perspective on size of these markets.

This section of the Supplement to the Revised Program for Mass Transportation was prepared in response to these requests. It presents travel and demographic data on 41 zones within the MBTA District. The information is shown in a format that permits comparison of characteristics of different zones in the MBTA District.

Travel Information to be Presented in this Supplement

This supplement to the Revised Program for Mass Transportation presents projected 1980 A.M. peak period (3 hour) total travel (all motorized vehicles). In the fall of 1974, the Central Transportation Planning Staff (CTPS) developed this information for use in the Northern and Southwest Corridors. The projections have been used in conjunction with feasibility studies and Environmental Impact Analysis for transit projects in these two corridors. Since the 1980 projections were intended primarily for use in only two corridors, it should be noted that the forecasts are based on more detailed information in the North and Southwest corridors than they are in other corridors. The data provided in the 1980 forecasts should be sufficient, however, for use at this high level of aggregation.

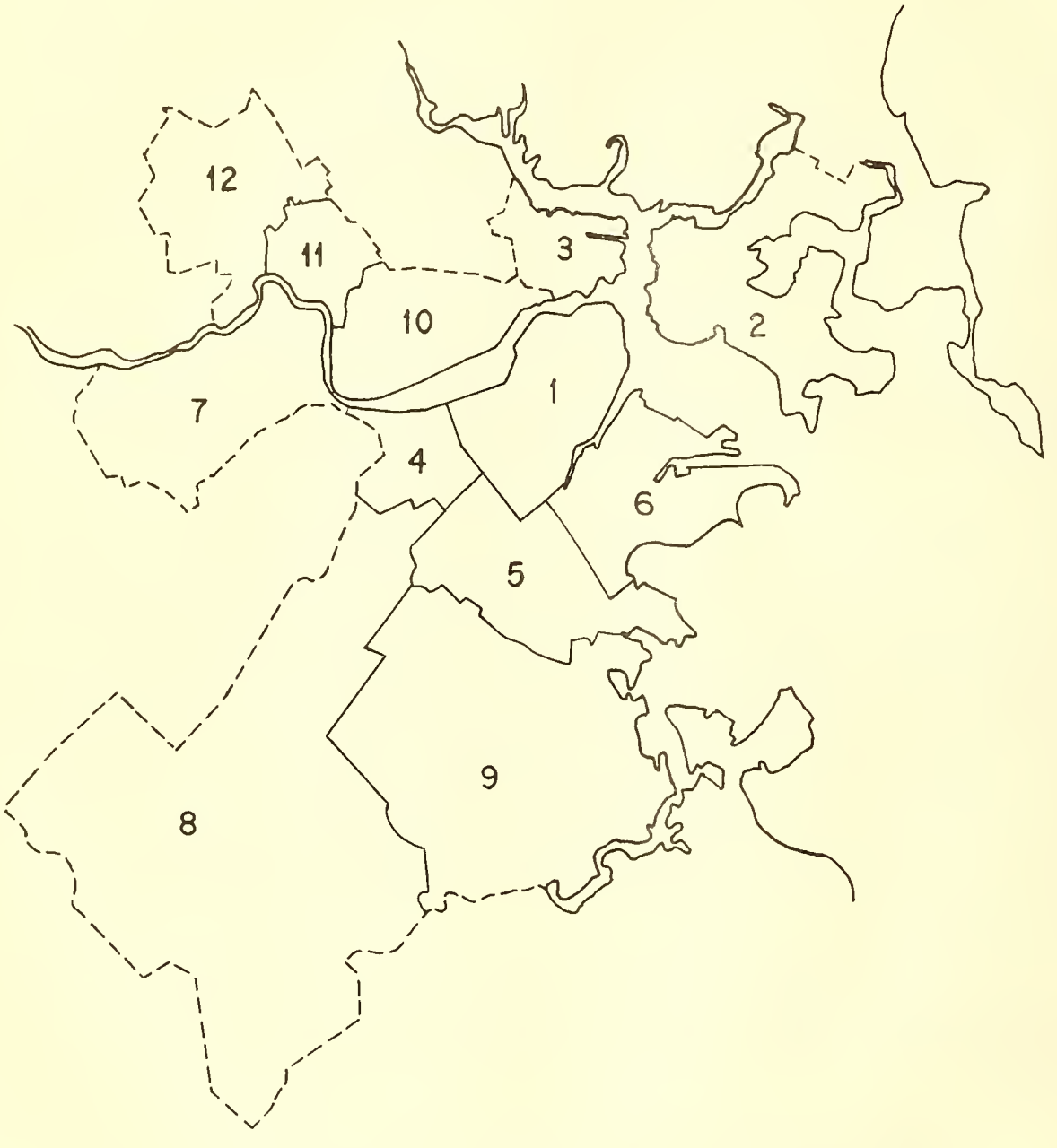
The projections assumed a 'base case' transit supply to be in operation in 1980. This supply is very similar to the present supply offered. The 'base case' supply can be summarized as follows:

1. The Red Line is completed in the south to South Braintree with no South Quincy station.

2. The Orange Line is completed in the north to Oak Grove. In the south, the Orange Line remains elevated to the Forest Hills terminal.

3. All other rapid transit and streetcar terminals remain the same as at present.

4. Levels of service for rapid transit are the same as at present. The Riverside line and commuter rail are upgraded.



1976 PMT

BOSTON & CAMBRIDGE ZONES

1 Mile

Figure: 2

5. Local feeder bus service remains at the same level as at present.

6. Express bus service is not assumed. A more accurate estimate of mode split to the core in areas presently served by express bus is presented in the appendix to this report.

Subdivision of Eastern Massachusetts into Zones: The Choice Of Boundaries

The 1980 information was originally in the form of a table showing travel between 894 zones in Eastern Massachusetts. This table was compressed to a 47 zone table. The boundaries of 41 of the 47 zones are shown in the figure facing the introduction to this report. The 47 zones are defined in accord with the following objectives:

1. The zones were to follow town boundaries. The exception to this is the zones that subdivide Boston and Cambridge. In these instances, town boundaries were not followed to allow more thorough analysis of these areas.

2. The zones were to increase in area as distance from downtown Boston increased.

3. The zones were to follow CTPS corridor boundaries, where possible.

4. The zone boundaries were to follow the boundaries of the MBTA District.

5. Towns within the same zone were to have similar demographic characteristics, where possible.

6. Towns served by the same highways or transit lines, were to be included in the same zone, where possible.

The outer zones are composed of more than one town. For example zone 38 consists of Ashland, Framingham, Natick, and Sherborn. Some of the inner zones consist of an individual town. Zone 25, for example, consists of Newton. Boston is divided into nine zones which approximate neighborhood boundaries. Cambridge is divided into three zones.

The subdivision of Boston and Cambridge was intended to permit more a detailed analysis of some neighborhoods within those cities. The eight innermost Boston and Cambridge zones are defined as the 'regional core'. This core is the location of the greatest employment densities in the region. The figure on the opposite page shows the zones subdividing Boston and Cambridge.

Definitions of Categories of Directional Travel

In this supplement, travel information is presented for each zone within the MBTA District. Zones 1 through 41 are within the District. Zones 42 through 47 are outside the District.

Travel information for zones outside of Boston and Cambridge but within the MBTA District (Zones 13 through 41) is presented in a uniform format. For each of these zones, 1980 A.M. peak period total travel from the zone is presented for seven categories of direction of travel.

These categories are as follows:

1. Travel to the Boston Central Business District (CBD)--The Boston CBD is defined as the Massachusetts Avenue peninsula or 'Boston Proper'.

2. Travel to the remainder of the 'core'--The core consists of the Boston CBD, East Boston, Charlestown, Fenway/Kenmore, Inner Roxbury/Dorchester, South Boston, and Cambridge from the Harvard Square area east. Travel from the zone to all of these areas except the Boston CBD is counted in this category.

3. Inward travel--Trips from the zone in the direction of the core with a destination short of the core fall under this category. For example, travel from zone 35 to zone 16 is 'inward travel'.

4. Through core--Travel from the zone in the direction of the core with a destination beyond the core falls under this category. For example, travel from zone 35 to zone 22 is 'through core'.

5. Circumferential--Travel from a zone to another zone that is roughly the same distance from the Boston CBD is defined as 'circumferential'. For example, travel from zone 35 to zone 36 falls under this category. If travel from a zone could be categorized either as 'circumferential' or as 'through core', it is considered as 'through core'.

6. Outward--Travel from a zone to another zone that is further from the Boston CBD is considered 'outward'. For example, travel from zone 35 to zone 47 is outward. If travel between two zones could be categorized either as 'outward' or 'through core', it is considered 'through core'.

7. Internal--Travel with both origin and destination within a zone is categorized as internal.

Travel information for zones within Boston or Cambridge (Zones 1 through 12) is presented in a format that differs from the format used to show travel from the outer zones (13 to 41). Information is shown separately for the core (the core includes the Boston CBD), for Cambridge, and for the Boston zones located outside the core. Travel from the zones to six corridors comprising the remainder of Eastern Massachusetts (zones 13 to 47) is presented in this supplement. Travel from the corridors to zones in the core, and to the zone in the remainder of Cambridge is shown. Information on travel between zones comprising the core and information on trip making between Cambridge zones are presented.

The travel information is presented in both tabular and graphic form. The graphic presentation both summarizes the information from the tables and shows the relationship between the location of the zone being discussed and the core. The scale on the maps varies, depending upon the location of the zone in relation to the core. The estimated number of morning trips in a particular direction is shown by the thickness of the labeled arrow on the map. On all maps, the same scale is used to show the number of morning trips - one inch equals 60,000 trips.

Zones 1 through 6 and 10 and 11 - The Core

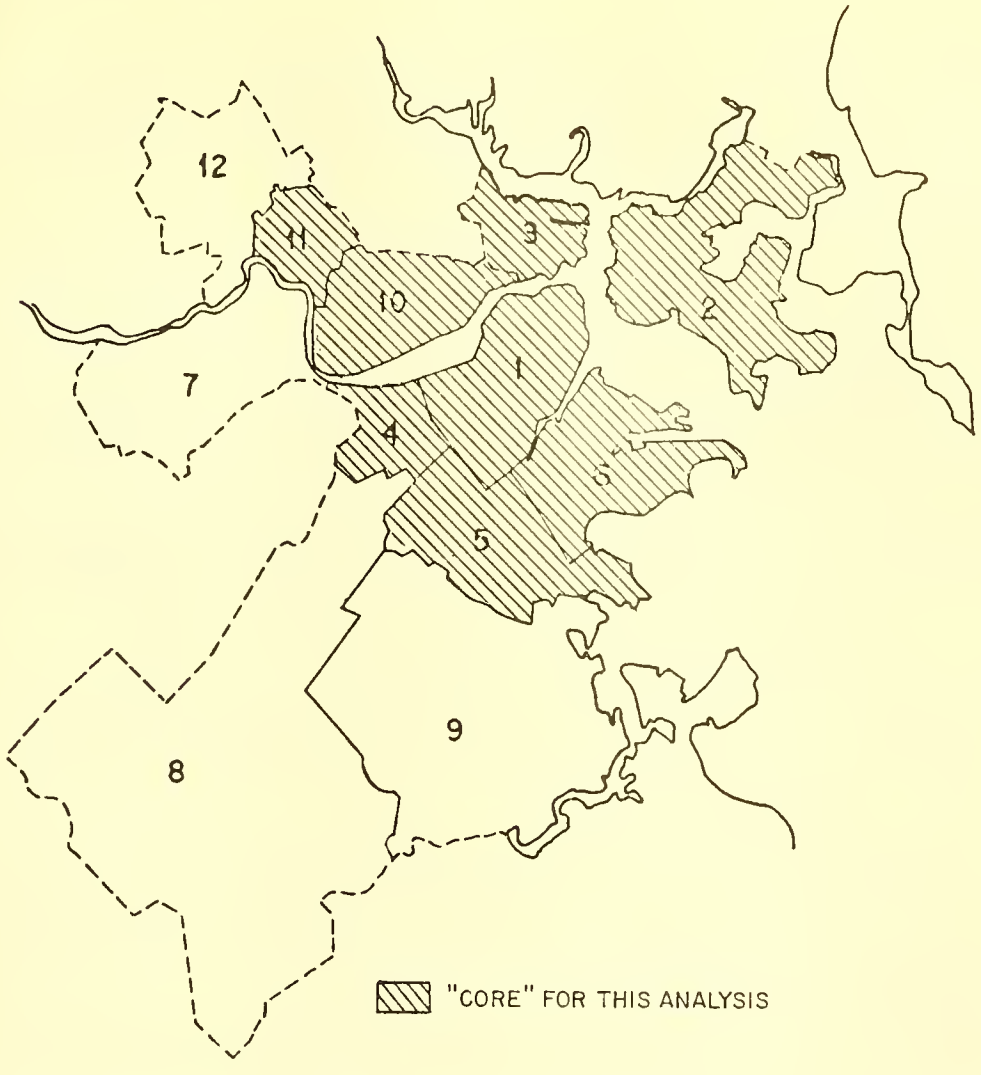
The core consists of six Boston zones and two Cambridge zones. (See the map that follows.) The 1970 population for the core is 336,000. The core has a very high population density, with over 12,000 persons per square mile. Fenway-Kenmore has the highest population density of any zone in the core, with over 21,000 persons per square mile. The zone with the lowest population density of any zone in the core is East Boston, with less than 7,000 persons per square mile. The relatively low density value for East Boston results from the inclusion of Logan Airport in the land area statistic used to calculate population density for this zone.

The core has the highest employment density in the region. The average median family income of the residents in the core is below the median family income for the region. More than half of the households in the core own no auto, according to the 1970 U.S. Census. The core is served intensity by the bus, streetcar, rapid transit, and rail network. Transit and walk trips make up the high proportions of total travel in the core than elsewhere in the region.

Forecasts for travel from the core for 1980 show that about 420,000 trips will be made during the A.M. peak period. Over 64 percent of the morning trips are inward. About 21 percent of these trips are internal to the zone. Only 14 percent of the A.M. trips are outward.

The tables that follow present 1980 travel forecasts for travel to and from each zone in the core. For some zones, the predominant direction of morning travel is to the zone. The Boston CBD, Fenway and Kenmore, South Boston, Cambridge East, and Harvard all have this characteristic. Each of these zones has a substantial number of employment or educational opportunities. For other zones, morning travel from the zone is almost as great as morning travel to the zone. This occurs for East Boston, Charlestown, and Inner Roxbury/Dorchester.

Morning travel to the core from the cities and towns outside of Boston and Cambridge is greatest from the northern corridor. The remaining trips to the core are more or less evenly distributed from every corridor except the southwest. The southwest corridor has the smallest share of morning travel from the core of all corridors. Reverse commuting from the core is greatest to the western, northwest, and northern corridors.



ZONES 1-6, 10, & 11 OF 47 CONSOLIDATED ZONE ANALYSIS
DEMOGRAPHIC DATA

Zone		1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
1	BOSTON CBD	69,552	N.A.	N.A.	19,040	13.5	$9,690	64.4	31.1	4.5
2	EAST BOSTON	38,873	N.A.	N.A.	6,728	11.7	$8,620	47.4	45.0	7.6
3	CHARLESTOWN	15,353	N.A.	N.A.	9,123	11.1	$8,827	48.8	43.7	7.5
4	FENWAY-KENMORE	32,965	N.A.	N.A.	21,840	10.2	$7,232	66.4	29.4	4.2
5	INNER ROXBURY & DORCHESTER	69,088	N.A.	N.A.	17,211	10.4	$7,468	57.4	36.6	6.0
6	SOUTH BOSTON	38,488	N.A.	N.A.	10,251	14.2	$8,704	57.0	37.2	5.8
10	EASTERN CAMBRIDGE	51,139	N.A.	N.A.	10,634	11.4	$8,900	46.2	44.5	9.3
11	HARVARD SQUARE	20,184	N.A.	N.A.	13,456	9.2	$11,900	34.4	54.5	11.1
	TOTAL FOR CORE	335,642	N.A.	N.A.	12,570	11.7	$8,679	55.7	37.9	6.4

1976
PMT

2 Miles

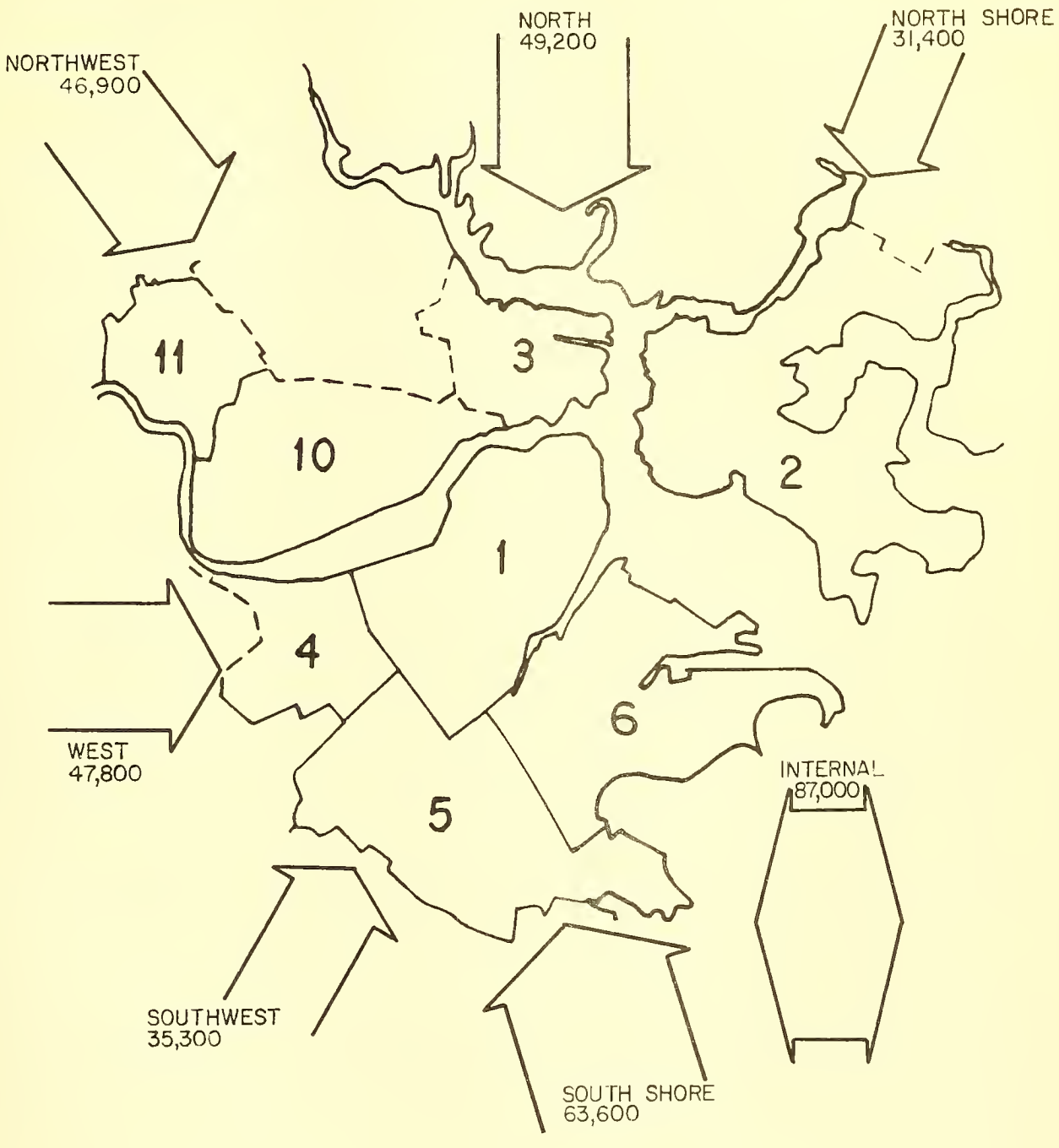
Figure:

TRAVEL DATA FOR REMAINDER OF
THE CORE
1980 A.M. PEAK PERIOD-ALL MODES

Travel To Zones in Core

Travel From	To Boston CBD	To East Boston	To Charlestown	To Fenway & Kenmore	To Inner Rox./Dor.	To South Boston	To Eastern Cambridge	To Harvard	Total
Boston CBD	11,100	600	400	2,500	1,700	1,500	1,700	600	20,100
East Boston	2,900	3,800	100	400	200	300	300	100	8,100
Charlestown	1,900	100	600	300	200	200	400	100	3,800
Fenway & Kenmore	4,400	100	100	2,700	900	200	1,500	300	10,200
Inner Rox./Dor.	7,500	100	100	1,900	3,700	1,600	800	300	16,000
South Boston	5,800	100	100	600	1,200	3,000	500	200	11,500
Eastern Cambridge	3,300	100	100	1,200	300	400	5,000	1,300	11,700
Harvard Square	1,300	100	100	500	100	100	1,800	1,600	5,600
Total from Core	38,200	5,000	1,600	10,100	8,300	7,300	12,000	4,500	87,000
Remainder of Eastern Massachusetts*	150,000	12,900	4,600	30,800	14,500	16,200	31,200	14,000	274,200
South Shore	36,400	2,100	600	6,200	5,900	6,300	4,600	1,500	63,600
Southwest	19,700	1,100	400	5,400	2,800	1,900	2,900	1,100	35,300
Western	25,300	1,000	400	7,600	2,200	1,800	6,600	2,900	47,800
Northwest	21,000	1,600	800	5,000	1,600	2,000	8,900	5,900	46,900
Northern	30,100	2,200	1,700	3,800	1,300	2,700	5,500	1,900	49,200
North Shore	17,400	4,900	700	2,800	700	1,500	2,700	700	31,400
Total	188,200	17,900	6,200	40,900	22,800	23,500	43,200	18,500	361,200

*Note: Boston and Cambridge zones that fall outside the core are included in sectors listed under "Remainder of Eastern Mass." in this table.



TOTAL TRIPS: 361,200

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL TO CORE

1 Mile

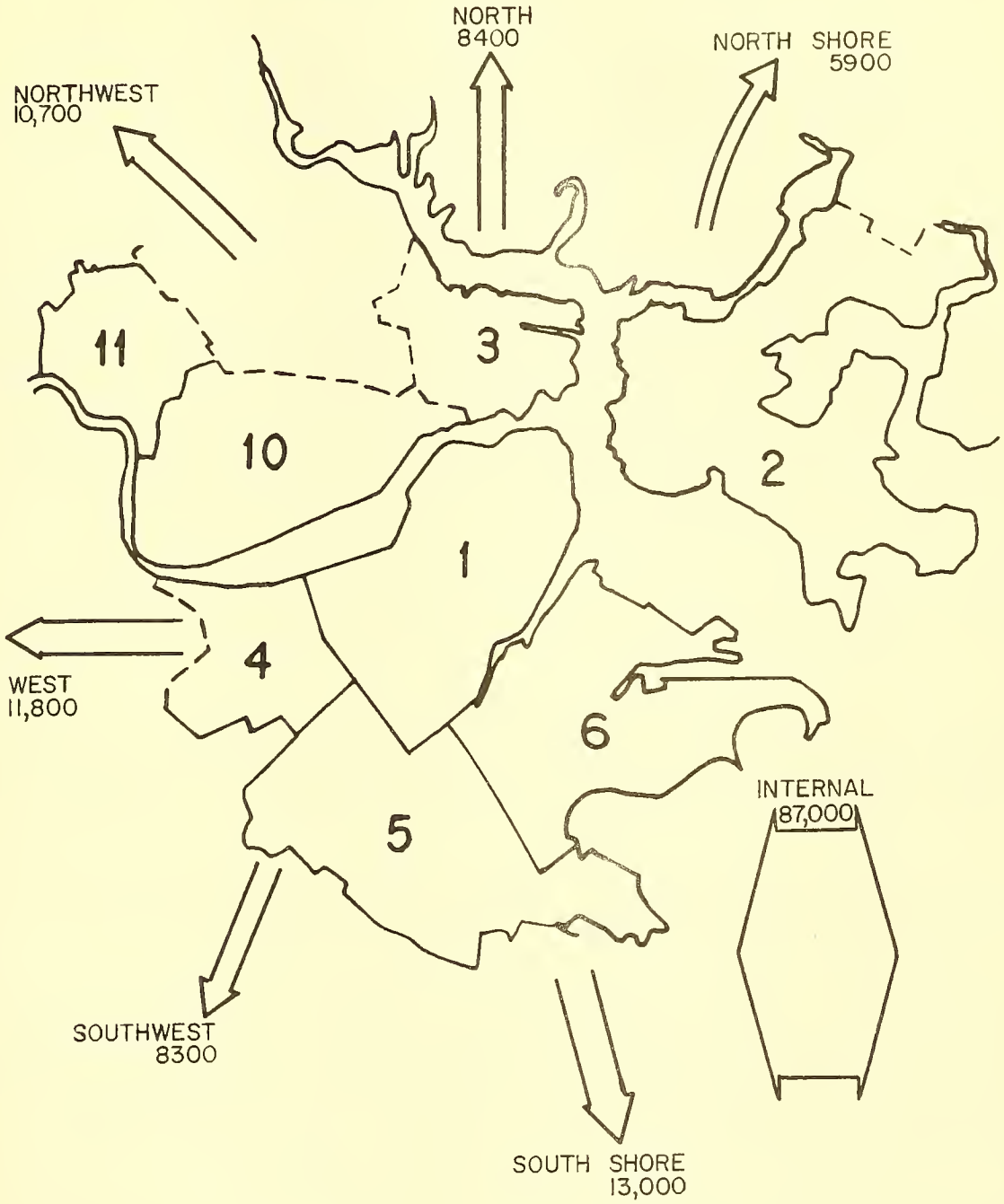
Figure:

TRAVEL DATA FOR REMAINDER OF
THE CORE
1980 A.M. PEAK PERIOD-ALL MODES

Travel From Zones in Core

Travel To	From Boston CBD	From East Boston	From Charlestown	From Fenway & Kenmore	From Inner Rox./Dor.	From South Boston	From Eastern Cambridge	From Harvard	Total
Boston	11,100	2,900	1,900	4,400	7,500	5,800	3,300	1,300	38,200
East Boston	600	3,800	100	100	100	100	100	100	5,000
Charlestown	400	100	600	100	100	100	100	100	1,600
Fenway & Kenmore	2,500	400	300	2,700	1,900	600	1,200	500	10,100
Inner Rox./Dor.	1,700	200	200	900	3,700	1,200	300	100	8,300
South Boston	1,500	300	200	200	1,600	3,000	400	100	7,300
Eastern Cambridge	1,700	300	400	1,500	800	500	5,000	1,800	12,000
Harvard Square	600	100	100	300	300	200	1,300	1,600	4,500
Total to Core	20,100	8,100	3,700	10,200	16,000	11,500	11,800	5,600	87,000
Remainder of Eastern Massachusetts*	16,200	7,200	3,500	6,200	8,600	4,900	7,800	3,700	58,100
South Shore	3,300	1,300	600	1,100	3,600	1,900	800	400	13,000
Southwest	2,400	500	200	1,500	1,700	700	900	400	8,300
Western	3,800	500	400	1,900	1,400	700	2,300	800	11,800
Northwest	2,500	1,100	600	900	900	700	2,600	1,400	10,700
Northern	2,900	1,300	1,100	500	700	600	800	500	8,400
North Shore	1,300	2,500	600	300	300	300	400	200	5,900
Total	36,300	15,300	7,200	16,400	24,600	6,400	19,600	9,300	145,100

* Note: Boston and Cambridge zones that fall outside the core are included in Sectors listed under under "Remainder of Eastern Mass." in this table.



TOTAL TRIPS: 145,100

1976 PMT	1980 A.M. PEAK PERIOD TRAVEL FROM CORE	1 Mile	Figure:

Zones 7, 8, and 9 - Portions Of Boston Outside the Core (Brighton, Outer Roxbury, Outer Dorchester, Jamaica Plain, Hyde Park, Mattapan, West Roxbury, and Roslindale)

Zone 7 consists of Brighton. According to 1970 census information, the population of Brighton is almost 64,000. Brighton is a high density residential community. The income level for the residents of Brighton is below the estimated average for the metropolitan area.

Brighton is served by MBTA bus service and by the Green Line. It is also served by Route 30 and Route 20.

Forecasts for travel from Brighton for 1980 show 21,000 trips made during the A.M. peak period. According to CTPS estimates, one quarter of these trips will be to the Boston CBD and another quarter will be to the rest of the core. About 15 percent will be internal, and 4 percent will be to the remainder of Boston outside the core (zones 8 and 9). Another 29 percent of the A.M. peak period travel from Zone 7 will be to the remainder of Eastern Massachusetts (areas outside of Boston and Cambridge).

Of the morning trips to the core from Brighton, 62 percent are by transit. Trips with Boston CBD destinations represent about 49 percent of all trips to the core, and about 67 percent of the trips to Boston CBD are by transit.

Zone 8 consists of Jamaica Plain, Roslindale, Hyde Park, and West Roxbury. According to the 1970 census, the population of zone 8 is 157,000. The zone has a high population density. The income level of its residents is lower than the average for the metropolitan area.

Zone 8 is served by MBTA bus service, by the Orange Line, by the Providence Main Line of CONRAIL, and by the Needham branch of CONRAIL. The main highway serving the area is Route 1.

Forecasts for 1980 travel from Zone 8 show about 48,000 trips made during the A.M. peak period. Of these, about 23 percent will be to Boston CBD, about 19 percent will be to the rest of the core, 24 percent will be internal, and 8 percent will be to the remainder of Boston outside of the core (zones 7 and 9). The remaining 26 percent of the A.M. peak period travel will be to the remainder of Eastern Massachusetts outside of Boston and Cambridge.

Of the morning trips to the core, 64 percent are by transit. Trips with Boston CBD destinations represent 53 percent of all trips

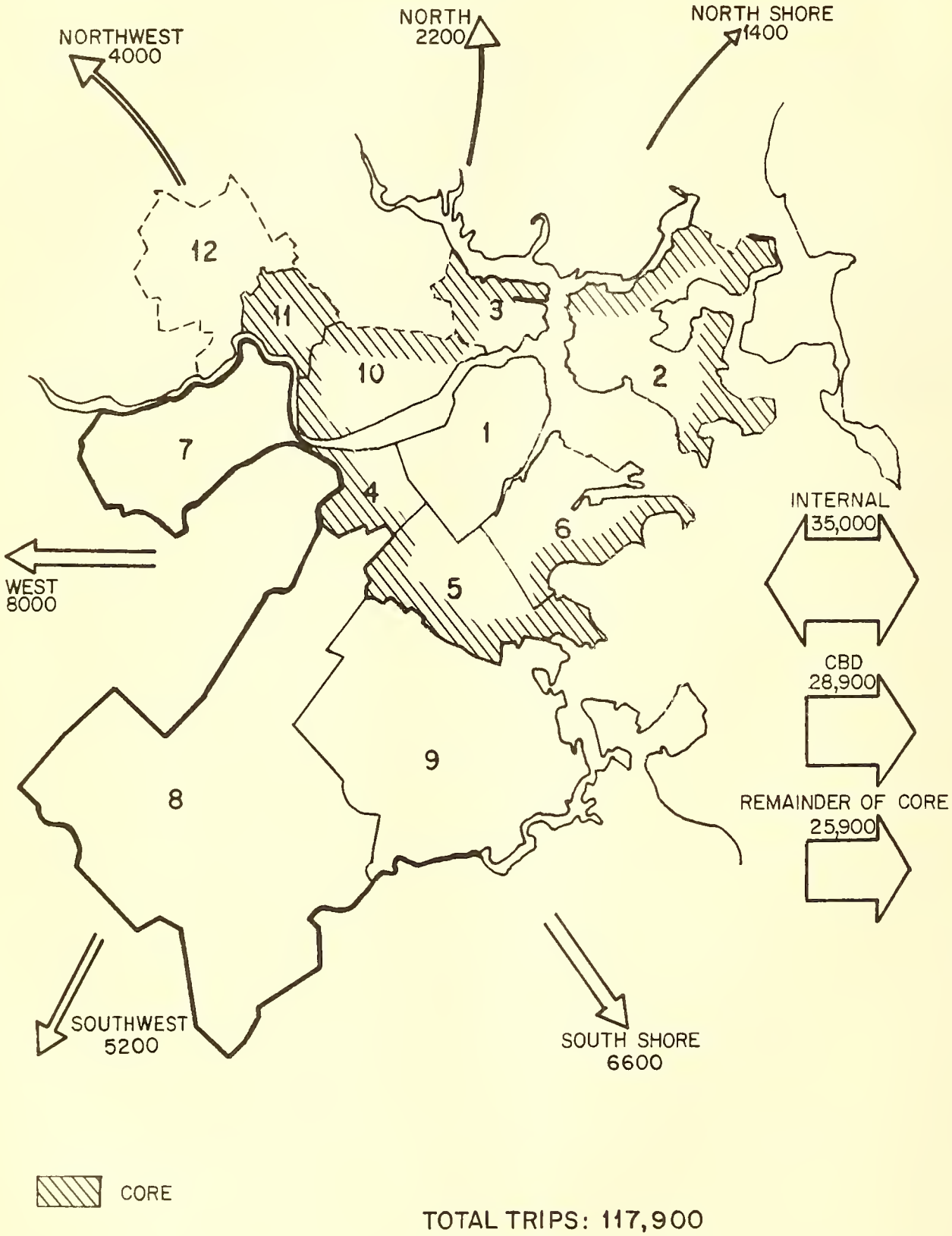
to the core. About 68 percent of the trips to the Boston CBD are by transit.

Zone 9 consists of Outer Dorchester, and Mattapan. According to information from the 1970 U.S. census, the population of Zone 9 is 154,000. Zone 9 has high population density. The zone has similar income characteristics to those of Zone 8.

The zone is served by the Red Line, and by MBTA bus service. The Southeast Expressway is the main highway serving the area.

Forecasts for travel from Zone 9 for 1980 show over 48,000 trips made during the A.M. peak period. Of these trips, about 25 percent will be to the Boston CBD and about 23 percent will be to the rest of the core. About 24 percent will be internal, and about 7 percent will be to the remainder of Boston outside of the core (zones 8 and 9). According to CTPS estimates, 18 percent of the A.M. peak period travel will be to the remainder of Eastern Massachusetts (areas outside of Boston and Cambridge).

Of the morning trips to the core, about 69 percent are by transit. Trips with Boston CBD destination represent about 54 percent of all trips to the core. Another 73 percent of the trips to the Boston CBD are by transit.



1976 PMT	1980 A.M. PEAK PERIOD TRAVEL FROM BOSTON ZONES OUTSIDE CORE (ZONES 7,8 & 9)	1 Mile Figure:

TRAVEL DATA FOR BOSTON OUTSIDE CORE

1980 A.M. PEAK PERIOD - ALL MODES

	From Brighton	From Jam. Plain, Roslindale, W. Rox., Hyde Park	From Outer Dorchester, Mattapan	Total
TRAVEL TO:				
Boston CBD	5,200	11,300	12,400	28,900
Remainder of Core	5,300	9,300	11,300	25,900
Remainder of Boston	4,000	15,600	15,500	35,000
(internal)	(3,100)	(11,600)	(11,900)	
Cambridge	2,900	2,300	2,200	7,400
Remainder of Eastern Mass*	6,200	12,200	9,000	27,400
South Shore	600	2,500	3,500	6,600
Southwest	600	3,500	1,100	5,200
Western	2,500	3,600	1,900	8,000
Northwest	1,600	1,200	1,200	4,000
Northern	500	900	800	2,200
North Shore	400	500	500	1,400
Total	21,000	48,500	48,400	117,900

*Note: Cambridge and Boston zones are not included in sectors listed under "Remainder of Eastern Mass." in this table.

1976 PMT

CAMBRIDGE ZONES

1/2 Mile

Figure:

Zones 10, 11, and 12 - Cambridge

Three zones comprise the city of Cambridge. (See the map on the preceeding page.) The portion of Cambridge east of Harvard Square is in zone 10. This zone is called 'Eastern Cambridge'. It includes Massachusetts Institute of Technology, Central Square, Kendall Square, and East Cambridge. Harvard Square and vicinity are included in zone 11. The portion of Cambridge to the northwest of Harvard Square is in zone 12. The 'regional core' referred to in this analysis includes zones 10 and 11, but it does not include zone 12.

According to CTPS estimates, the 1980 population for Cambridge will be almost the same as the 1970 population for Cambridge - about 100,000. Approximately one-half of the city's population resides in zone 10, Eastern Cambridge. All three zones have high population densities.

Auto ownership levels for the city are below the average for the region. One explanation for the wide range in auto ownership between the three zones is that zone 10 and zone 11 include many students who reside on campus and are counted as one person households.

Median family income for zone 10 is at a level below the regional average. Income levels for the other two zones are at the average for the region. One person households are not in the calculation of median family income statistics for the zones. The presence in zones 10 and 11 of on campus residents who are counted as one person households does not explain the variation in mediam family income levels between the three zones.

Three Red Line stations and one Green Line station are located in Cambridge. The city is served by an extensive network of local bus routes. The city is served by Routes 2, 3, 16, and 28.

According to CTPS estimates for 1980 travel, about 41,500 trips will be made during the morning peak period from Cambridge. About 20,000 of these trips will originate from the Eastern Cambridge zone, over 9,000 will begin in the Harvard Square zone, and about 12,000 will come from the zone representing Cambridge north and west of Harvard Square. This distribution of Cambridge trip origins between the three zones is roughly proportional to the population of the zones.

Travel from Cambridge origins is distributed to destinations in the following proportions: About 24 percent of the morning peak period trips are estimated to be to destinations within Boston's part of the regional core. About 8 percent of the travel is to Boston outside of the core. Over 37 percent of the travel with Cambridge origins is to Cambridge destinations. Roughly 30 percent of the travel from Cambridge is to areas outside of Boston and Cambridge. More of the travel from Cambridge to places outside of Boston and Cambridge is to the northwest sector than to any other sector.

According to CTPS estimates for 1980 morning peak period travel, more trips will be made to Cambridge than from Cambridge. An estimated 75,000 trips will be made to Cambridge. Travel to the Eastern Cambridge zone (43,000 trips) represents over 57 percent of the total travel to Cambridge. The Eastern Cambridge share of total travel to Cambridge is somewhat higher than the Eastern Cambridge share of 1970 population. This reflects the fact that Cambridge employment is highly concentrated in the Eastern Cambridge zone. The Harvard Square zone is also the site of significant commercial and employment activity. This is reflected in the estimates that nearly twice as many persons will travel to the Harvard Square zone in the morning peak period as will travel from that zone in the morning.

About 20 percent of the travel to Cambridge during the morning peak is estimated to be from Boston. Another 20 percent of the travel will be internal to the city of Cambridge. Roughly 60 percent of the travel to Cambridge will be from locations other than Boston or Cambridge. The majority of the trip origins outside of Boston and Cambridge are from locations in the northwest and northern corridors.

ZONES 10-12 OF 47 CONSOLIDATED ZONE ANALYSIS
DEMOGRAPHIC DATA

Zone	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Household None	One	Two or
10 EASTERN CAMBRIDGE	51,139	N/A	N/A	10,634	11.4	Approx. $8,900	46.2	44.5	9.
11 HARVARD SQUARE	20,184	N/A	N/A	13,456	9.2	Approx. $11,900	34.4	54.5	11.
12 NO. & WEST CAMBRIDGE	29,037	N/A	N/A	5,531	13.6	Approx. $11,500	23.4	59.5	17.
TOTAL FOR CAMBRIDGE	100,361	100,000	0.0	7,220	11.6	$9,815	37.6	50.6	11.

TRAVEL DATA FOR CAMBRIDGE

1980 A.M. PEAK-ALL MODES

TRAVEL TO CAMBRIDGE

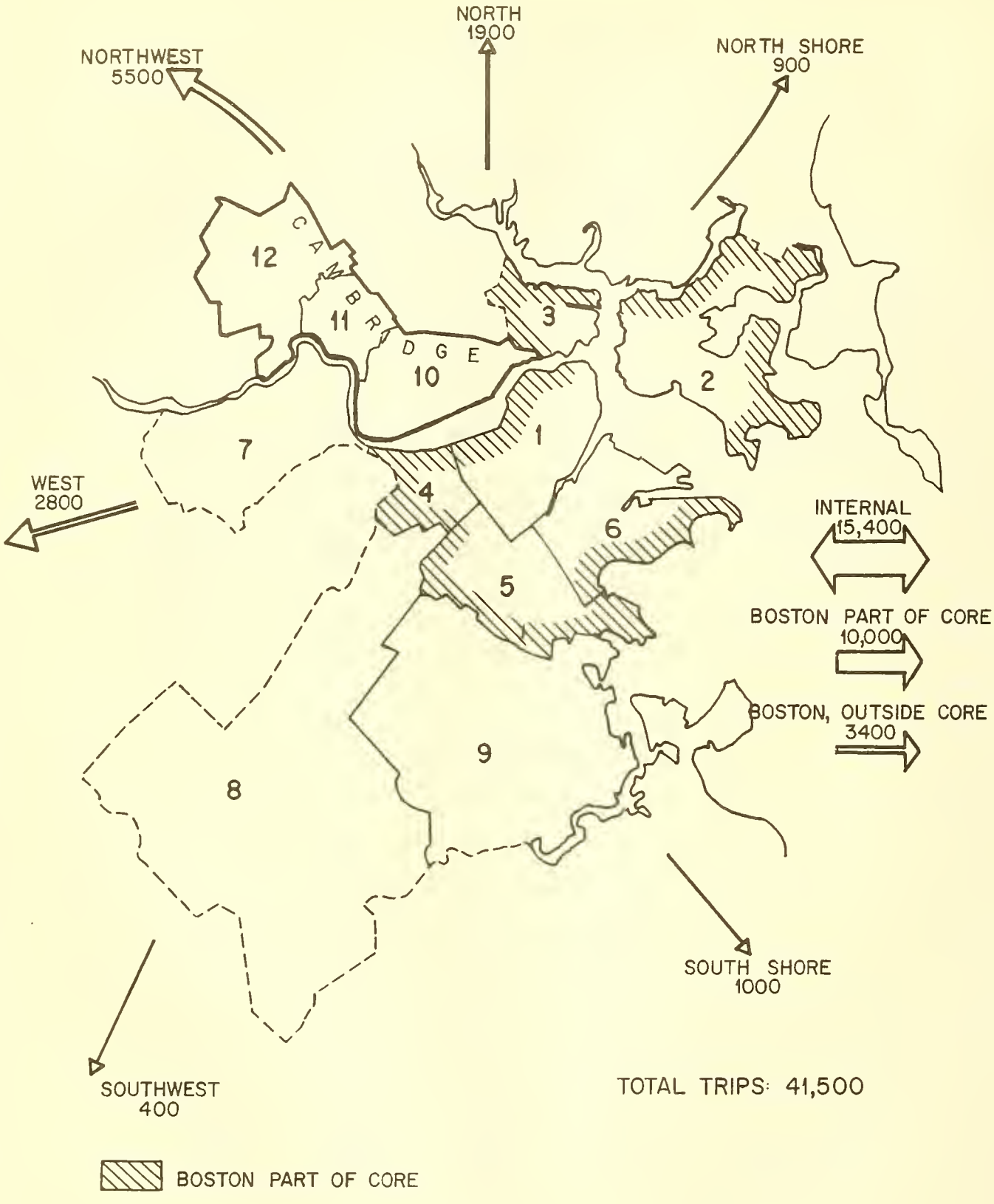
Travel From	To Eastern Cambridge	To Harvard Square	To North & West Cambridge	Total From Cambridge
Boston CBD	1,700	600	400	2,700
Remainder of Boston's Core	3,500	1,000	400	4,900
Remainder of Boston	5,000	1,800	600	7,400
Cambridge	8,000	4,400	3,000	15,400
Cambridge East	5,000	1,300	400	6,700
Harvard Square	1,800	1,600	500	3,900
No. & West Cambridge	1,200	1,500	2,100	4,800
Remainder of Eastern Massachusetts	24,900	10,700	9,000	44,600
South Shore	3,000	1,000	300	4,300
Southwest	1,400	500	200	2,100
Western	4,600	2,200	700	7,500
Northwest	7,700	4,400	5,000	17,100
Northern	5,500	1,900	2,300	9,700
North Shore	2,700	700	500	3,900
Total	43,100	18,500	13,400	75,000

TRAVEL DATA FOR CAMBRIDGE

1980 A.M. PEAK-ALL MODES

TRAVEL FROM CAMBRIDGE

Travel To	From Eastern Cambridge	From Harvard Square	From North & West Cambridge	Total From Cambridge
Boston CBD	3,400	1,300	1,400	6,100
Remainder of Boston's Core	2,100	800	1,000	3,900
Remainder of Boston	1,900	700	800	3,400
Cambridge	6,700	3,900	4,800	15,400
Cambridge East	5,000	1,800	1,200	8,000
Harvard Square	1,300	1,600	1,500	4,400
No. & West Cambridge	400	500	2,100	3,000
Remainder of Eastern Massachusetts	5,500	2,700	4,300	12,500
South Shore	400	300	300	1,000
Southwest	200	100	100	400
Western	1,500	600	700	2,800
Northwest	2,200	1,000	2,300	5,500
Northern	800	500	600	1,900
North Shore	400	200	300	900
Total	19,600	9,400	12,300	41,500

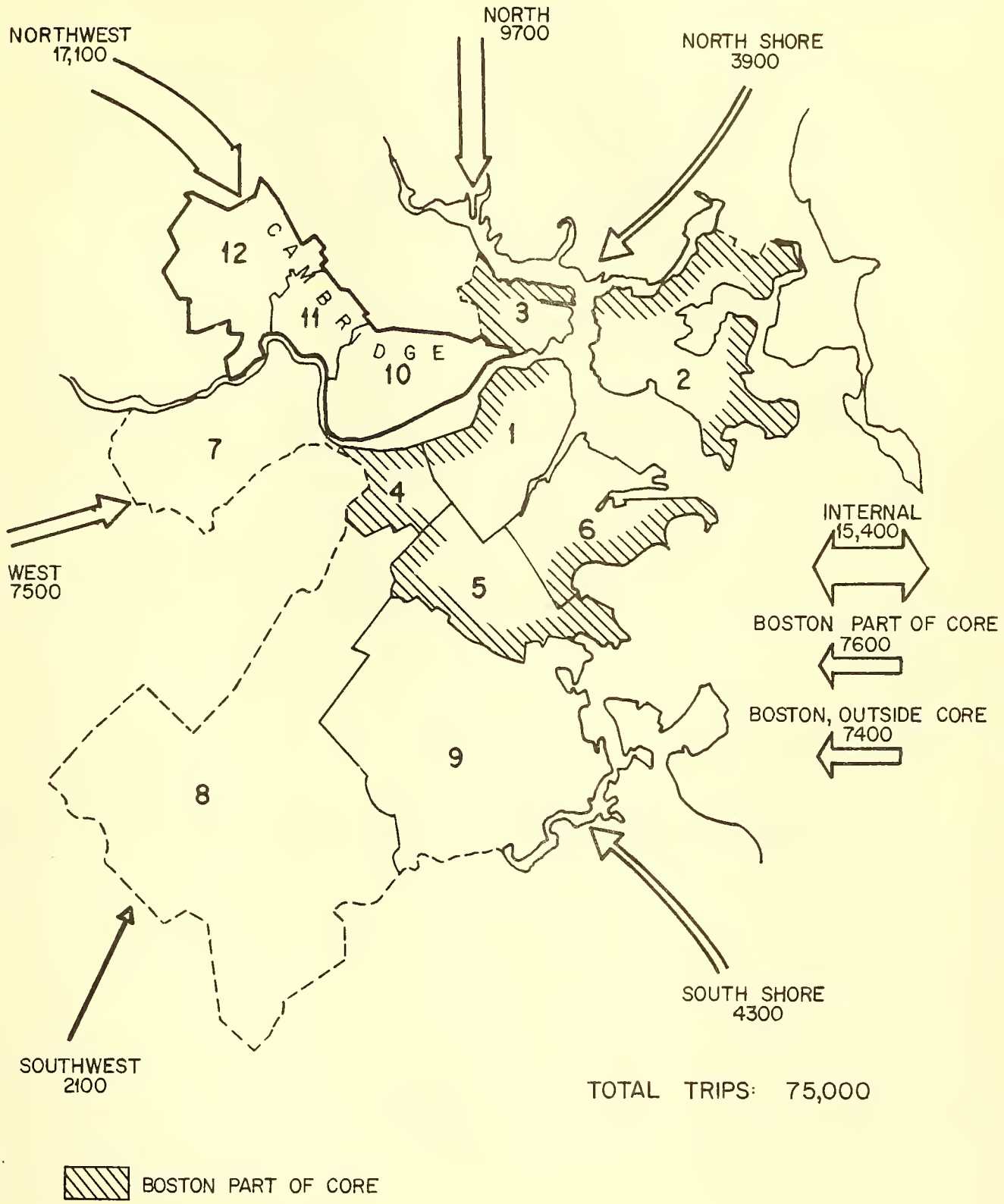


1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM CAMBRIDGE

1 Mile

Figure:



1976 PMT

1980 A.M. PEAK PERIOD TRAVEL TO CAMBRIDGE

1 Mile

Figure:

Zone 13 - Chelsea

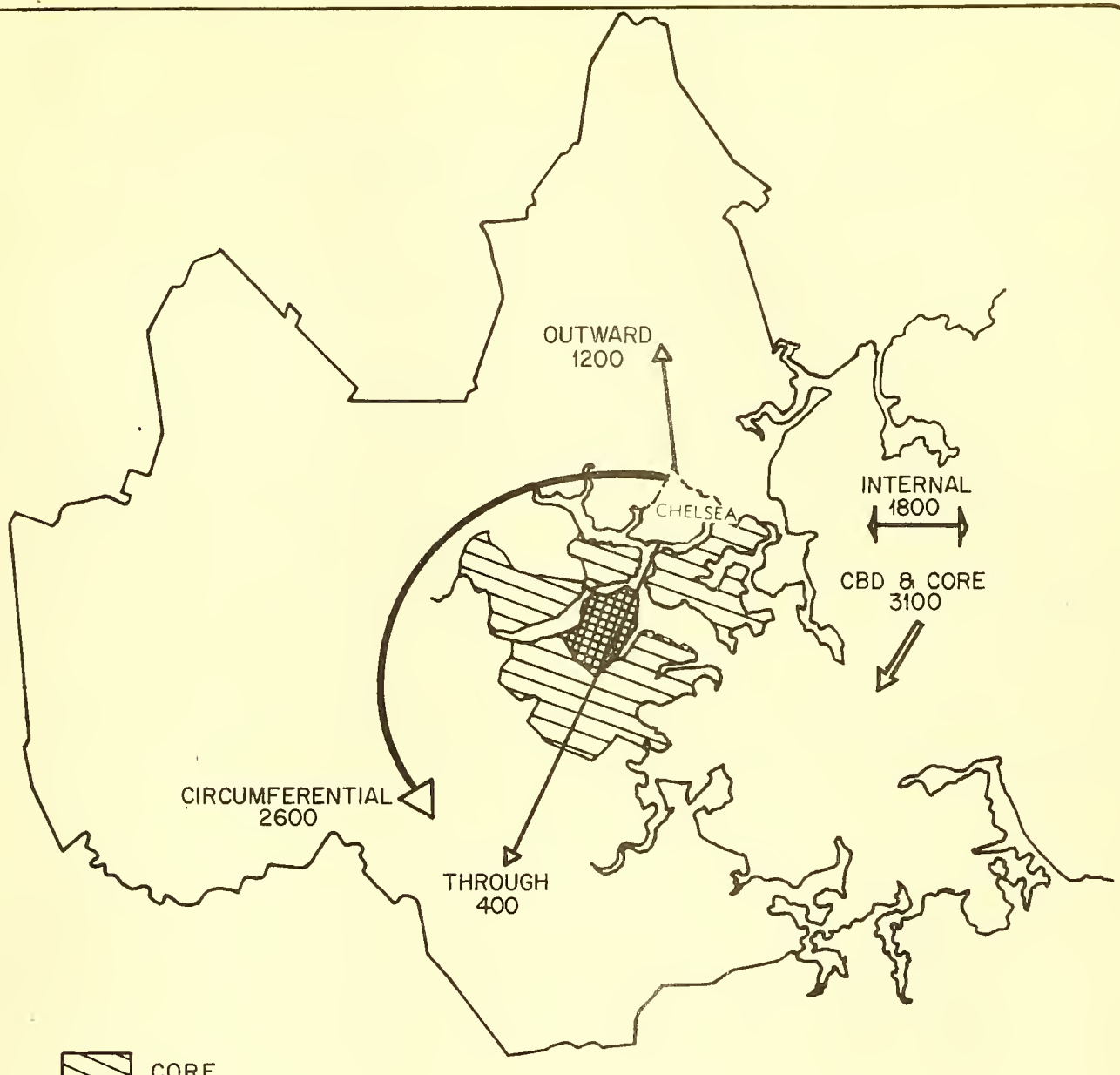
Zone 13 consists of the city of Chelsea. The CTPS estimate of the 1980 population is 26,000. Chelsea is characterized as an employment center as well as a community with an older urban commercial center. Chelsea is also a residential community of very high density. According to CTPS estimates, Chelsea is experiencing a decline in population. This is also the case for some cities and towns adjacent to Chelsea. Income levels for Chelsea residents are below the average for the metropolitan area.

Chelsea is served by MBTA bus service. The city is near several Blue Line stations. The city is served by Route 1.

Forecasts for travel from zone 13 for 1980 show over 9,000 trips made during the A.M. peak period. Of these trips 20 percent are internal to the zone. Over 33 percent are destined to be to the core, 29 are circumferential, and 13 are outward. About 4 percent of the A.M. peak period trips are through the core.

Of the morning trips to the core in 1980, about 68 percent are destined to be by transit. Trips with destination to the Boston CBD, represent about 55 percent of all trips to the core. About 72 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
CHELSEA	30,625	26,000	-17.7	14,113	13.6	$8,973	44.8	45.4	9.8



TOTAL TRIPS 9100

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,700	1,400	0	400	2,600	1,200	1,800	9,100
Percent of Total Peak Travel	18.7	15.4	0	4.4	28.5	13.2	19.8	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 13

2 Miles

Figure:

Zone 14 - Revere and Winthrop

Zone 14 consists of the city of Revere and the town of Winthrop. The CTPS estimate of 1980 population is approximately 63,000. Both towns are high density residential communities.

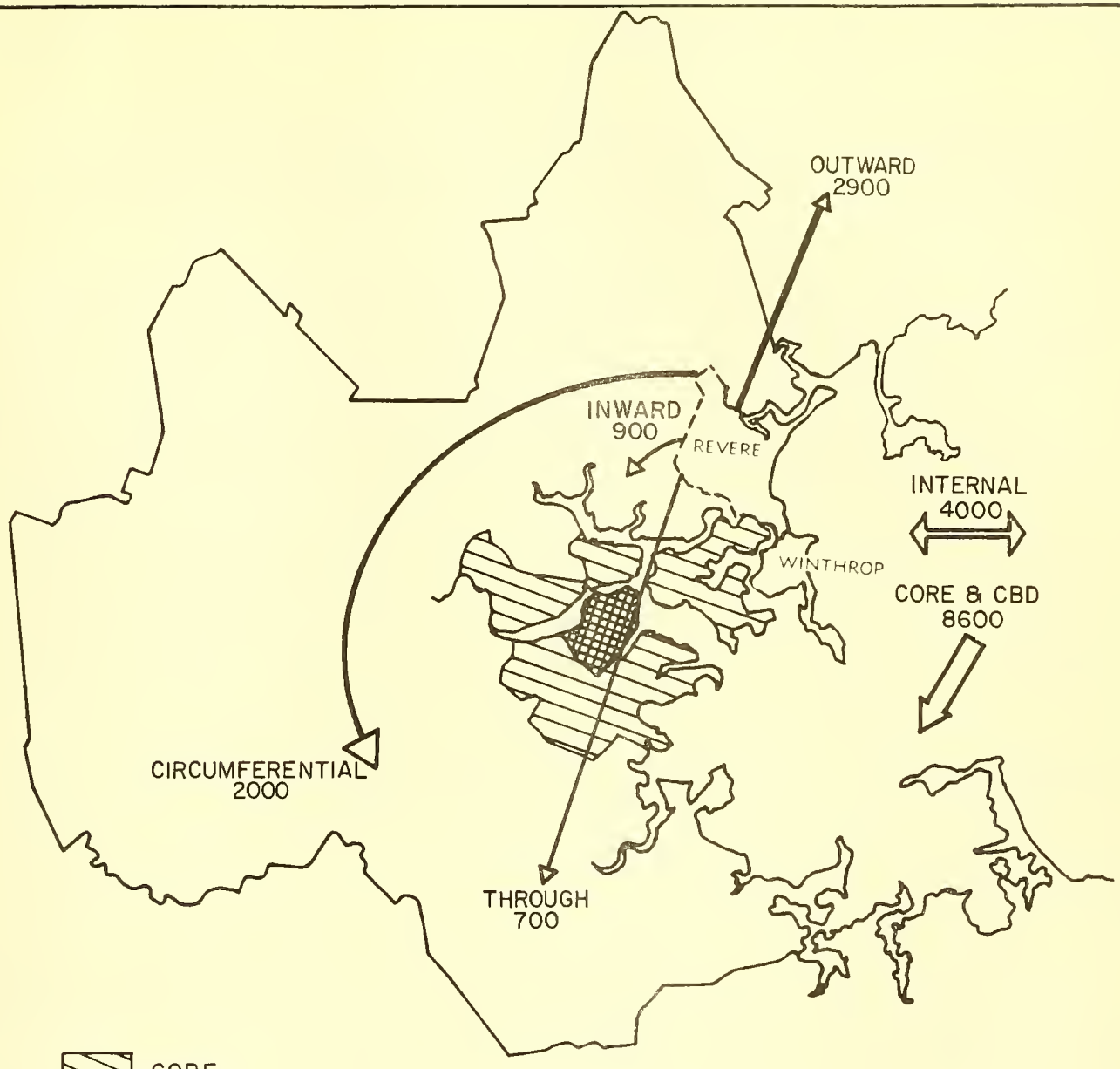
According to CTPS estimates, Revere is growing very slowly, and Winthrop is declining in population. The residents of both towns have similar income and auto ownership characteristics.

Both towns in zone 14 are served by the Blue line. Revere is served by Route 1. Winthrop is served by Route 145.

Forecasts for travel from zone 14 for 1980 show over 19,000 trips made during the A.M. Peak Period. About 20 percent of these trips are internal to the zone. Of the morning trips 45 percent are to be destined to the core. Approximately 5 percent will be inward with destinations before the core. Almost 4 percent of the 1980 A.M. peak period travel will be through the core, 10 percent will be circumferential, and 15 percent will be outward.

Of the morning trips to the core, about 87 percent are by transit. Trips with Boston CBD destinations represent about 56 percent of all trips to the core. About 68 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
REVERE	43,159	44,500	+ 3.1	6,829	11.4	$10,325	24.2	56.8	19.0
WINTHROP	20,335	18,400	-10.5	12,475	13.1	$11,685	19.1	59.1	21.8
TOTAL	63,494	62,900	- .9	7,791	11.9	$10,744	22.6	57.5	19.9



TOTAL TRIPS 19,100

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	4,800	3,800	900	700	2,000	2,900	4,000	19,100
Percent of Total Peak Travel	25.1	19.9	4.7	3.7	10.5	15.2	20.9	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 14

2 Miles

Figure:

Zone 15 - Everett and Malden

Zone 15 consists of the cities of Everett and Malden. The CTPS estimates of 1980 population for the towns in Zone 15 is 97,000. Both Everett and Malden are communities with older urban retail centers. There are a significant number of employment opportunities in both centers.

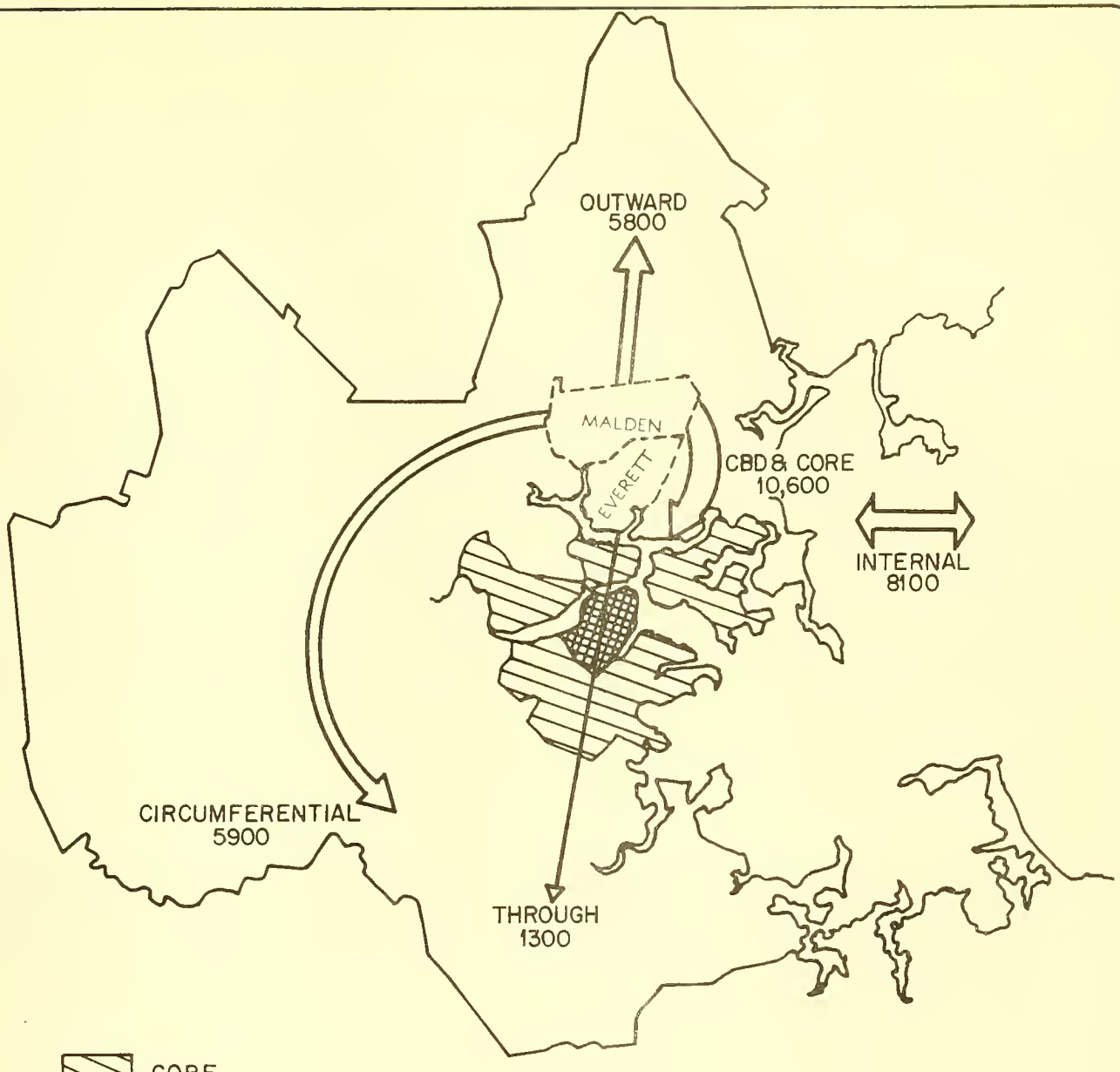
The CTPS estimates show that the towns of Zone 15 are not growing. Both towns have similarly high population densities. The residents of both towns have similar income and auto-ownership characteristics.

Malden is served by the Orange Line. Everett is served by feeder bus service to the Orange Line. Both towns are very close to Route 1 and Interstate 93.

Forecasts for travel from Zone 15 for 1980 show over 32,000 trips made during the A.M. peak period. Of these trips over 25 percent will be internal to the zone. About 33 percent will be to the core, 18 percent will be outward, and almost 19 percent will be circumferential. More than 4 percent of the A.M. peak period travel from zone 15 during 1980 will pass through the core.

Of the morning trips to the core, about 68 percent are by transit. Trips with Boston CBD destinations represent about 60 percent of all trips to the core. About 72 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
EVERETT	42,485	41,000	-3.6	11,329	12.6	$10,086	26.7	58.1	15.2
MALDEN	56,127	56,000	0.0	10,941	13.6	$10,204	26.1	56.6	17.3
TOTAL	98,612	97,000	-1.6	10,035	6.9	$10,154	26.4	57.2	16.4



TOTAL TRIPS 31,700

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	6,400	4,200	0	1,300	5,900	5,800	8,100	31,700
Percent of Total Peak Travel	20.2	13.2	0	4.2	18.6	18.3	25.5	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 15

2 Miles

Figure:

Zone 16 - Medford

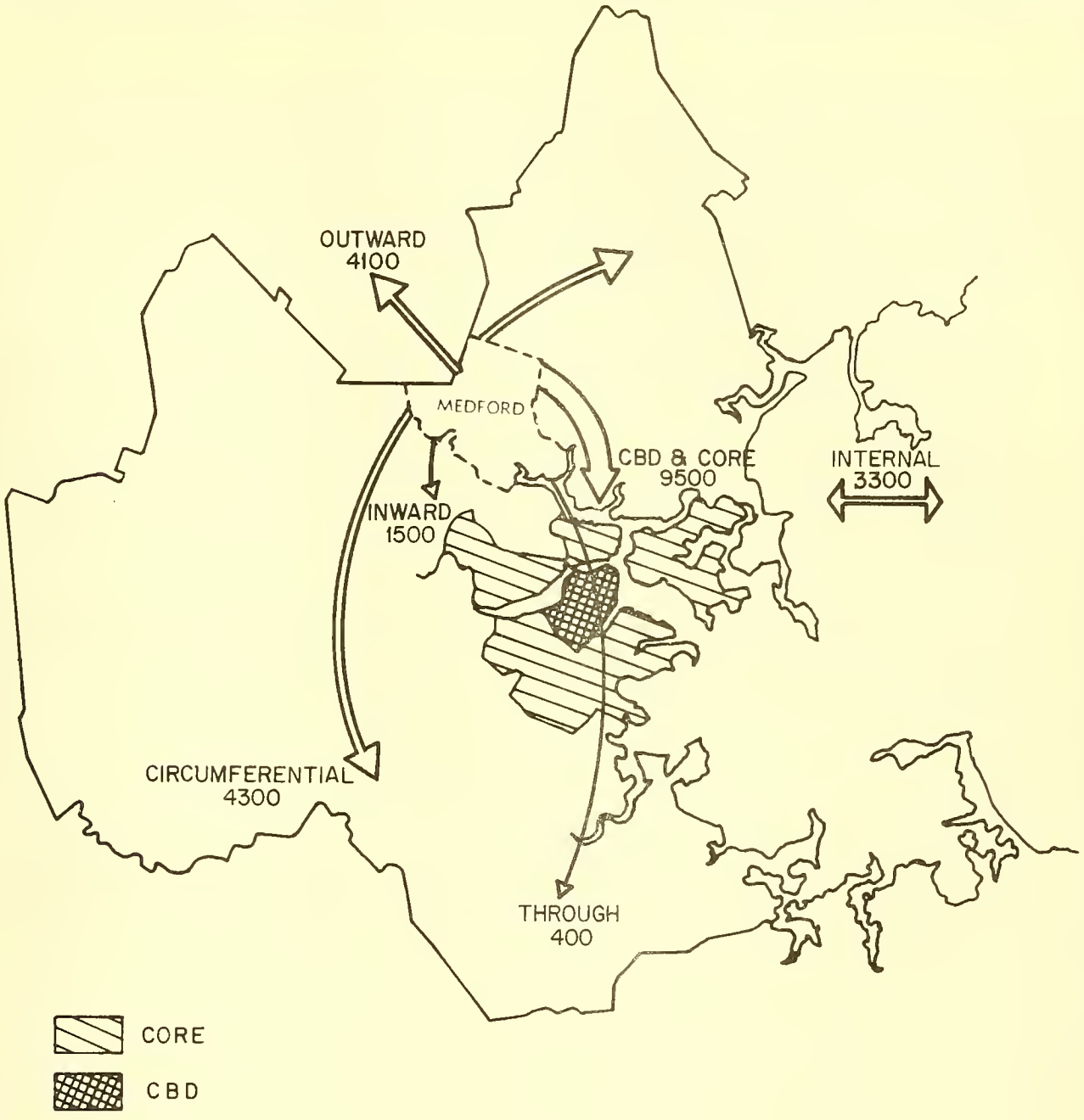
Zone 16 consists of the city of Medford. The CTPS estimate of 1980 population for zone 16 is 67,500. Medford is a high density residential community. According to CTPS estimates, Medford is growing at a slow rate.

Medford is served by the Reading Branch of the B&M Railroad, the Orange line, and by Interstate 93.

Forecasts for travel from zone 16 for 1980, show over 23,000 trips made during the A.M. peak period. About 14 percent of these trips are internal. More than 41 percent of these trips are destined to be to the core. According to CTPS estimates 7 percent of the A.M. peak period travel by 1980 will be inward with destinations outside the core, 19 percent will be circumferential, 18 percent will be outward. About 2 percent of the estimated 1980 travel will be through.

Of the morning trips to the core about 62 percent are by transit. Trips with Boston CBD destinations represent about 64 percent of all trips to the core. About 66 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
MEDFORD	64,397	67,500	+4.8	7,385	13.0	$11,145	20.2	57.7	22.1



TOTAL TRIPS 23,100

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	6,100	3,400	1,500	400	4,300	4,100	3,300	23,100
Percent of Total Peak Travel	26.4	14.7	6.5	1.7	18.6	17.8	14.3	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 16

2 Miles

Figure:

Zone 17 - Somerville

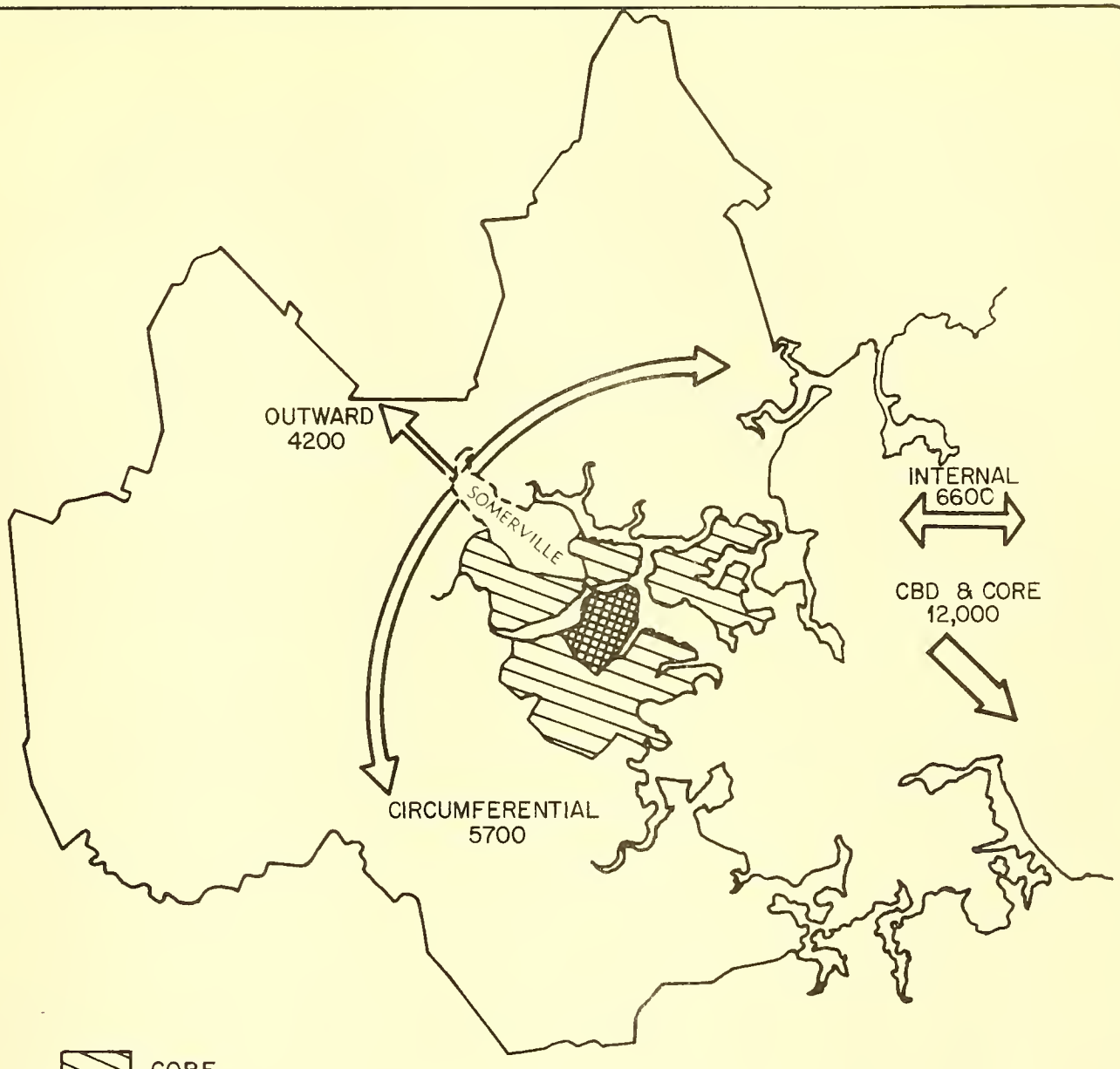
Zone 17 consists of the city of Somerville. The CTPS estimate of population for zone 17 by 1980 is 80,000. Somerville has the highest population density of any city in Massachusetts. The city is an employment center as well as a community with older urban commercial area. According to CTPS estimates, Somerville will experience a slight decrease in population by 1980. The median income of Somerville is lower than the estimated average for the metropolitan area.

Somerville is served by an extensive network of bus routes. The eastern part of the city is served by the Orange line, by Interstate 93, and by Route 28.

Forecasts for travel from zone 17 for 1980 show over 28,000 trips made during the A.M. peak period. About 23 percent of these trips are internal to the zone. Over 42 percent are to the core. Of the A.M. peak period travel, 20 percent will be circumferential, and about 15 percent outward.

Of the morning trips to the core in 1980, about 67 percent are by transit. Trips with Boston CBD destinations represent 52 percent of all trips to the core. About 73 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
SOMERVILLE	88,779	80,000	-.9	21,548	12.1	$9,594	34.1	54.7	11.2



TOTAL TRIPS 28,500

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	6,200	5,800	0	0	5,700	4,200	6,600	28,500
Percent of Total Peak Travel	21.7	20.4	0	0	20.0	14.7	23.2	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 17

2 Miles

Figure:

Zone 18 - Arlington and Belmont

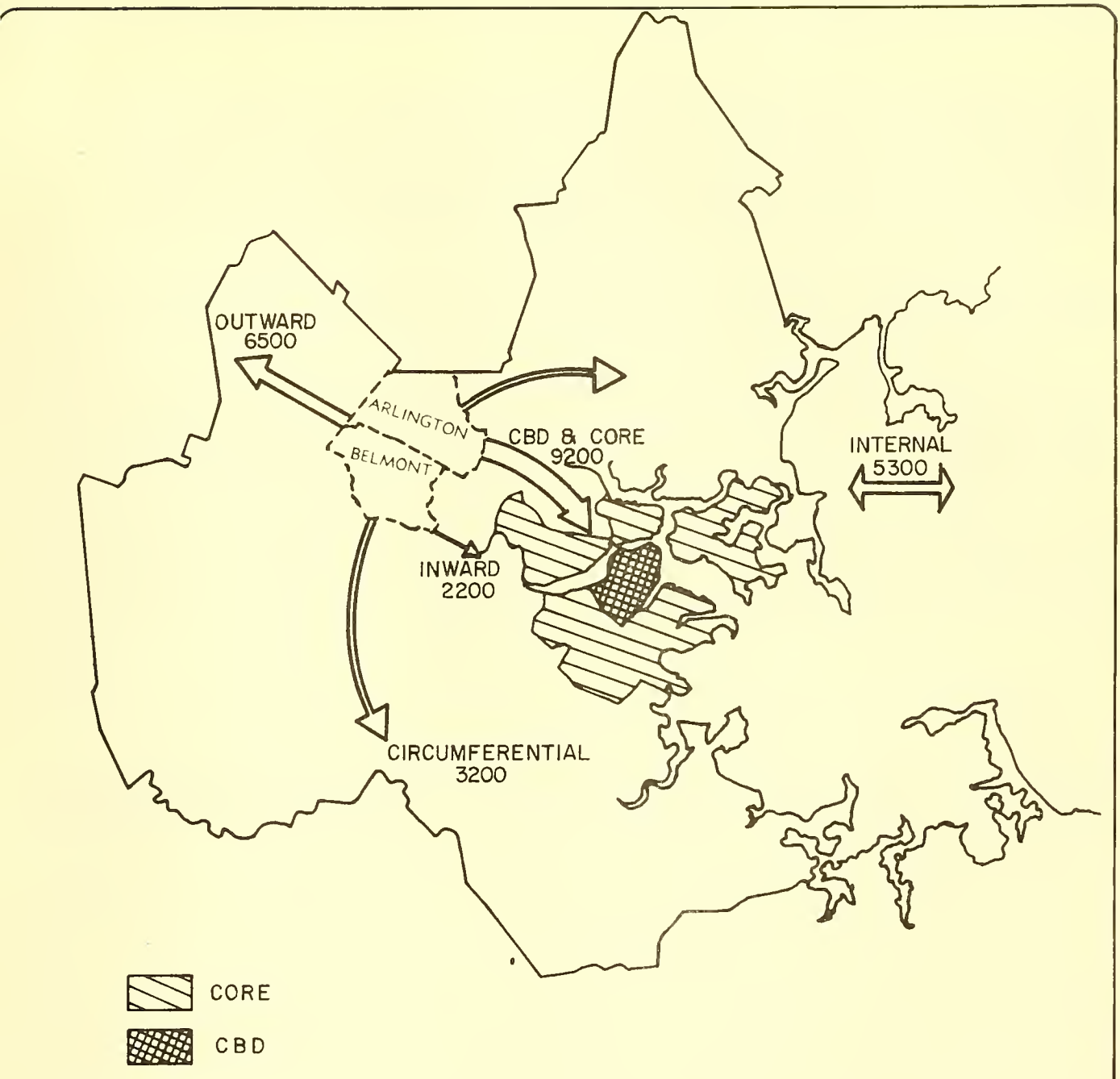
Zone 18 consists of the towns of Arlington and Belmont. The CTPS estimate of 1980 population for the towns in zone 18 is 82,000. Both towns have similar income and auto-ownership characteristics. Both towns are high density residential communities with some retail opportunities. Arlington has a higher population density than Belmont has. Both towns are projected to experience very limited growth in the 1970's.

Both towns in zone 18 are served by Route 2 and by Route 60. Both towns are linked more closely to Cambridge than to Boston by the arterial network. Arlington is served by the Lexington Branch of the B&M Railroad. Belmont is served by the Fitchburg Route of the B&M Railroad.

Forecasts for travel from zone 18 for 1980 show over 26,000 trips made during the A.M. period. Of these trips 20 percent will be internal to the zone. More than 34 percent are forecast for the core. About 8 percent of these trips are inward with destinations outside the core. Almost 25 percent are outward, and 12 percent are circumferential.

Of the morning trips to the core in 1980, about 54 percent are estimated to be by transit. Trips with destinations to the Boston CBD represent about 48 percent of the trips to the core. More than 55 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
RLINGTON	53,524	53,000	0.0	9,592	14.0	$12,247	13.8	59.8	26.4
ELMONT	28,285	29,000	+2.5	6,069	16.4	$13,559	12.6	54.1	33.3
OTAL	81,809	82,000	0.0	7,989	14.8	$12,711	13.4	57.8	28.8



TOTAL TRIPS 26,400

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	4,400	4,800	2,200	0	3,200	6,500	5,300	26,400
Percent of Total Peak Travel	16.7	18.2	8.3	0	12.1	24.6	20.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 18

2 Miles

Figure:

Zone 19 - Watertown

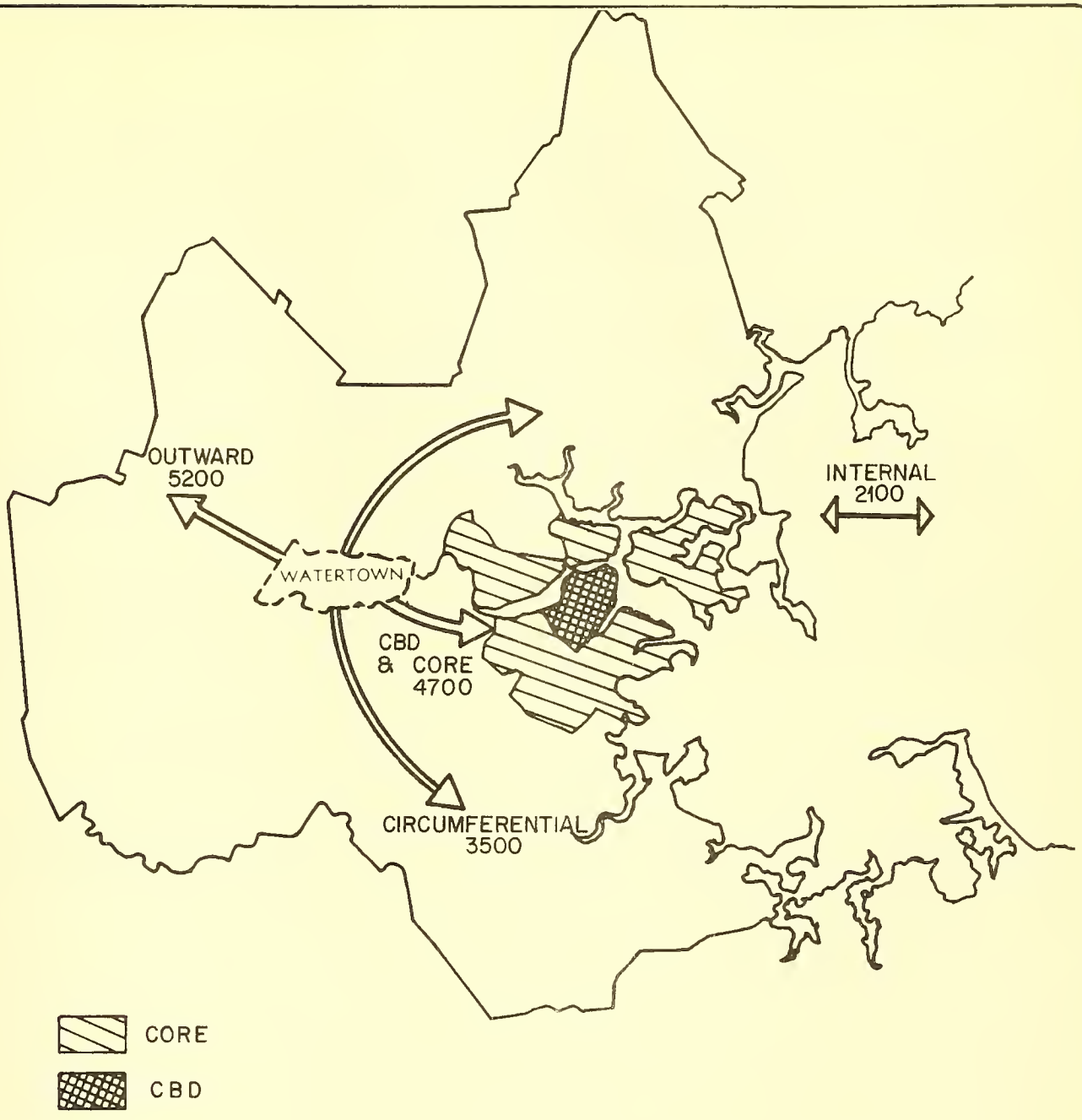
Zone 19 consists of the town of Watertown. The CTPS estimate of population for zone 19 by 1980 is about 38,000. Watertown is a high density residential community. According to CTPS estimates, Watertown is experiencing a small decline in population in this decade. The income and auto-ownership characteristics of Watertown are quite similar to the estimated regional average.

Watertown is served by Route 20, Route 16, and the Massachusetts Turnpike. The town is served by private bus carriers and by MBTA bus and trolley service.

Forecasts for travel from Watertown for 1980, show more than 15,000 trips made during the A.M. peak period. About 14 percent of these trips will be internal to the zone. Over 30 percent are to the core. Another 23 percent of the A.M. travel is estimated to be circumferential, and about 34 percent will be outward.

Of the morning trips to the core in 1980, 52 percent are destined to be by transit. Trips with Boston CBD destinations represent about 46 percent of all trips to the core. About 53 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
ATERTOWN	39,307	37,500	-4.8	9,426	12.7	$11,400	16.6	59.2	24.2



TOTAL TRIPS 15,500

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	2,000	2,700	0	0	3,500	5,200	2,100	15,500
Percent of Total Peak Travel	12.9	17.4	0	0	22.6	33.5	13.5	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 19

2 Miles

Figure:

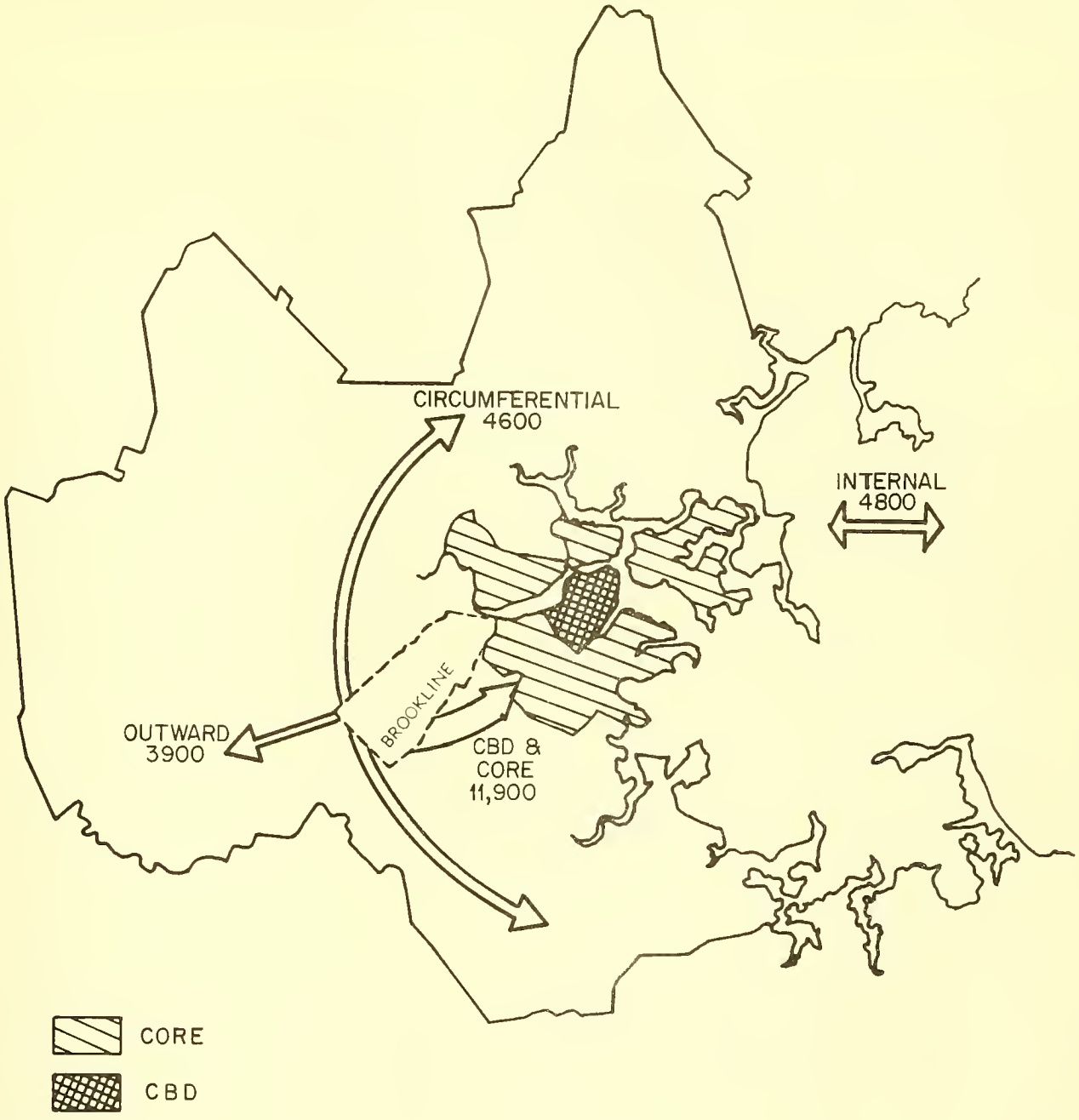
Zone 20 consists of the town of Brookline. The CTPS estimate of population for zone 20 by 1980 is about 62,000. Brookline is a high density residential community, with income characteristics slightly greater than the estimated regional average. According to CTPS estimates, there will be a small increase in the population of Brookline by 1980.

Brookline is served by the branches of the Green Line. Brookline is also served by three local streets radiating from Kenmore Square, by Route 9, and by Route 1.

Forecasts for travel from Brookline for 1980 show about 25,000 trips made during the A.M. peak period. Of these trips 19 percent will be internal. About 47 percent of these trips are destined to be to the core. Almost 16 percent will be outward, and 18 percent will be circumferential.

Of the morning trips to the core 60 percent are by transit. Trips with Boston CBD destinations represent 50 percent of all trips to the core. About 63 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
BROOKLINE	58,886	61,500	+4.4	8,634	20.0	$13,701	26.8	51.3	21.9



TOTAL TRIPS 25,200

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	5,900	6,000	0	0	4,600	3,900	4,800	25,200
Percent of Total Peak Travel	23.4	23.8	0	0	18.2	15.5	19.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 20

2 Miles

Figure:

Zone 21 - Milton and Quincy

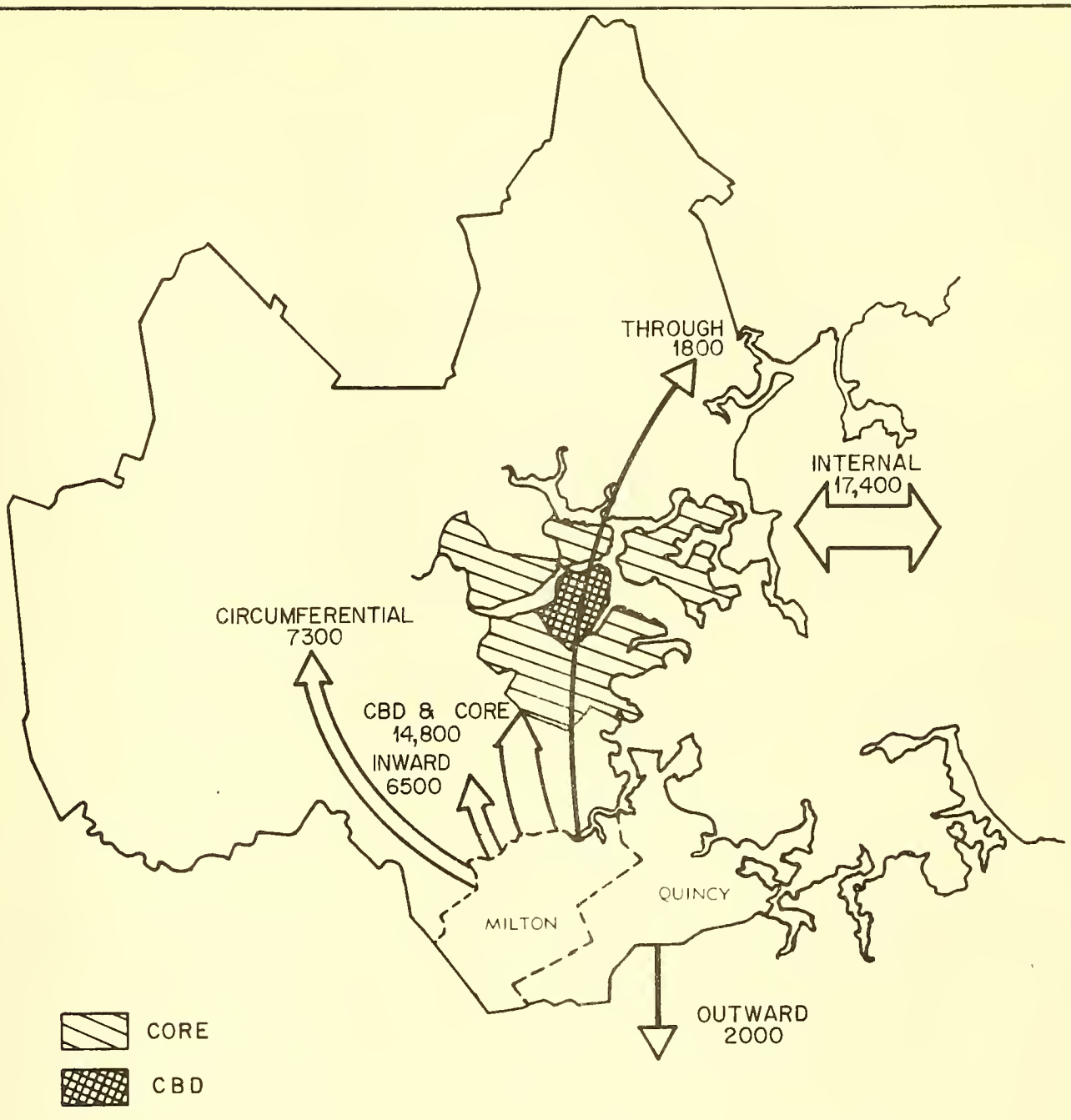
Zone 21 consists of the town of Milton and the city of Quincy. The CTPS estimate of 1980 population for zone 21 is 120,000. Quincy is a high density residential community. Quincy is also characterized as an employment center and as a community with an older urban commercial center. The town of Milton is a moderate density residential community. Milton is growing at a much faster rate than Quincy. Milton has a higher median family income than Quincy has. Auto ownership levels are higher in Milton than they are in Quincy.

Both communities are served by the Red Line. Three Red Line stations are in Quincy. Five stops on the Ashmont to Mattapan high speed line are in Milton. The zone is served by the Southeast Expressway and Route 128.

Forecasts for travel from zone 21 for 1980 show about 50,000 trips made during the A.M. peak period. Of these trips, 35 percent will be internal to the zone. About 30 percent are estimated to have the core as a destination. Another 13 percent of the A.M. trips are inward with destinations outside the core. About 4 percent are destined to go through the core. An estimated 4 percent will be outward, and about 15 percent will be circumferential.

Of the morning trips to the core, about 66 percent are by transit. Trips with Boston CBD destinations represent over 60 percent of all trips to the core. About 67 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
MILTON	27,190	30,000	+10.3	2,060	15.0	$14,728	8.0	48.8	43.2
QUINCY	87,966	90,000	+ 2.3	5,286	13.5	$11,094	16.8	58.6	24.6
TOTAL	115,156	120,000	+ 4.2	4,738	13.8	$11,940	14.8	56.5	28.7



TOTAL TRIPS 49,800

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	9,000	5,800	6,500	1,800	7,300	2,000	17,400	49,800
Percent of Total Peak Travel	18.1	11.6	13.0	3.6	14.7	4.0	35.0	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 21

2 Miles

Figure:

Zone 22 - Braintree, Holbrook, and Randolph

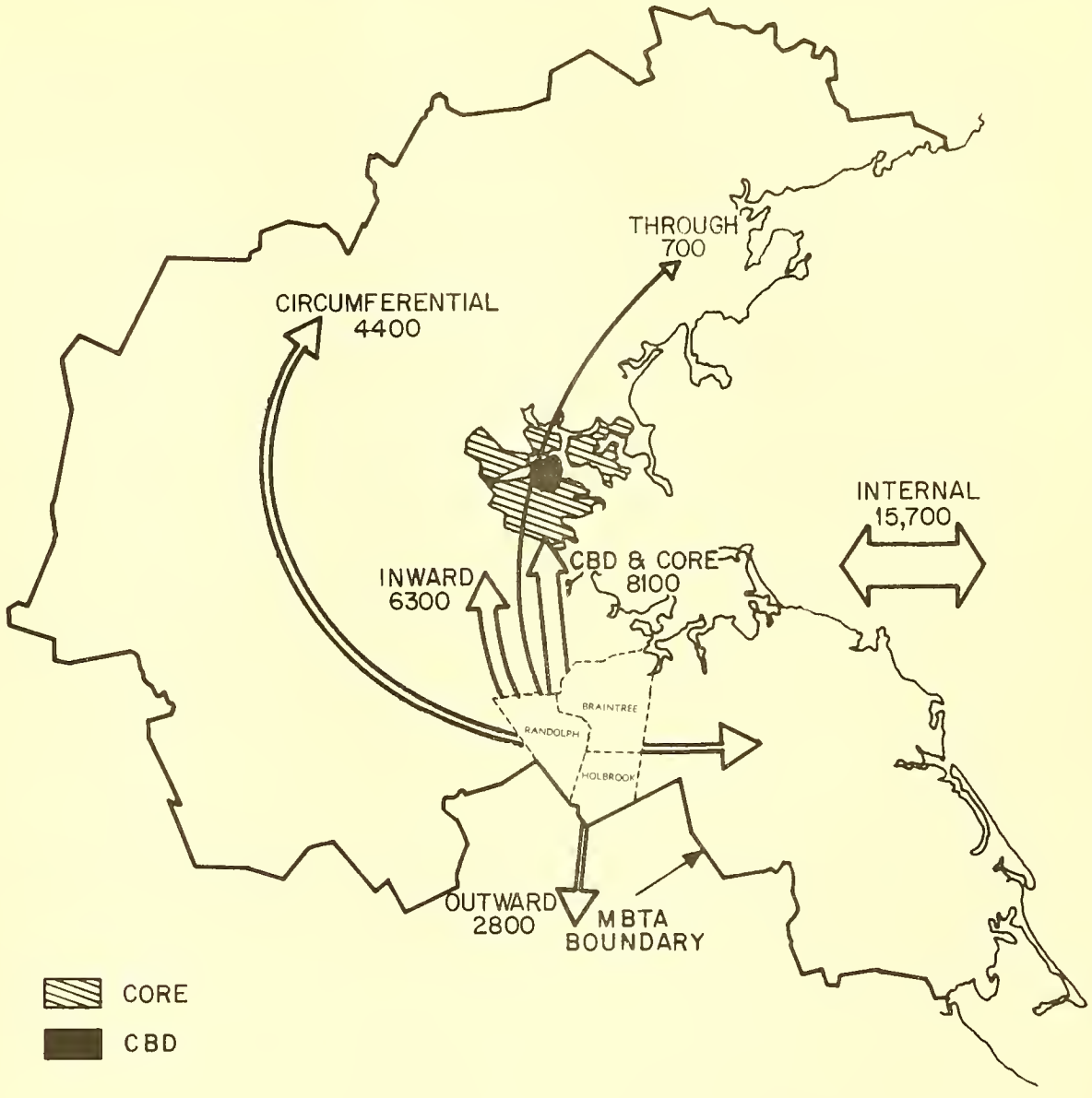
Zone 22 consists of the towns of Braintree, Holbrook, and Randolph. The CTPS estimate of 1980 population for the towns of zone 22 is 85,000. All three towns have moderate population densities. They also have similar income and auto ownership characteristics. According to CTPS estimates, all three towns are undergoing substantial population growth. Randolph is growing at a slower rate than either Braintree or Holbrook.

The towns in zone 22 are served by MBTA bus service. The bus routes offer feeder service to Red Line terminals at Quincy and Ashmont. Routes 3, 128, and 24 serve the zone.

Forecasts for travel from zone 22 for 1980 show about 38,000 trips made during the AM peak period. More than 41 percent of these trips will be internal to the zone. An estimated 21 percent will be to the core. Another 17 percent of the A.M. trips will be inward with destinations outside the core. Over 7 percent of the morning peak trips will be outward, about 7 percent will be circumferential, and about 2 percent will pass through the core with destinations outside the core.

Of the morning trips to the core, about 65 percent are by transit. Trips with Boston CBD destination represent about 62 percent of all trips to the core about 69 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
BRAINTREE	35,050	41,500	+18.4	2,432	9.4	$13,030	5.8	50.9	43.4
HOLBROOK	11,775	14,000	+18.4	1,609	6.3	$11,230	4.9	55.5	39.6
RANDOLPH	27,035	29,500	+ 9.1	2,620	7.0	$12,369	7.5	47.7	44.8
TOTAL	73,860	85,000	+15.8	2,304	8.03	$12,504	6.2	50.5	43.3



TOTAL TRIPS 38,000

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	5,000	3,100	6,300	700	4,400	2,800	15,700	38,000
Percent of Total Peak Travel	13.2	8.2	16.6	1.8	11.6	7.4	41.2	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 22

5 Miles

Figure:

Zone 23 - Canton, Dedham, Norwood, and Westwood

Zone 23 consists of the towns of Canton, Dedham, Norwood, and Westwood. The CTPS estimate of 1980 population for the towns in zone 23 is 99,000. All four towns are residential communities. Dedham and Norwood have moderate population densities. Westwood and Canton have low population densities.

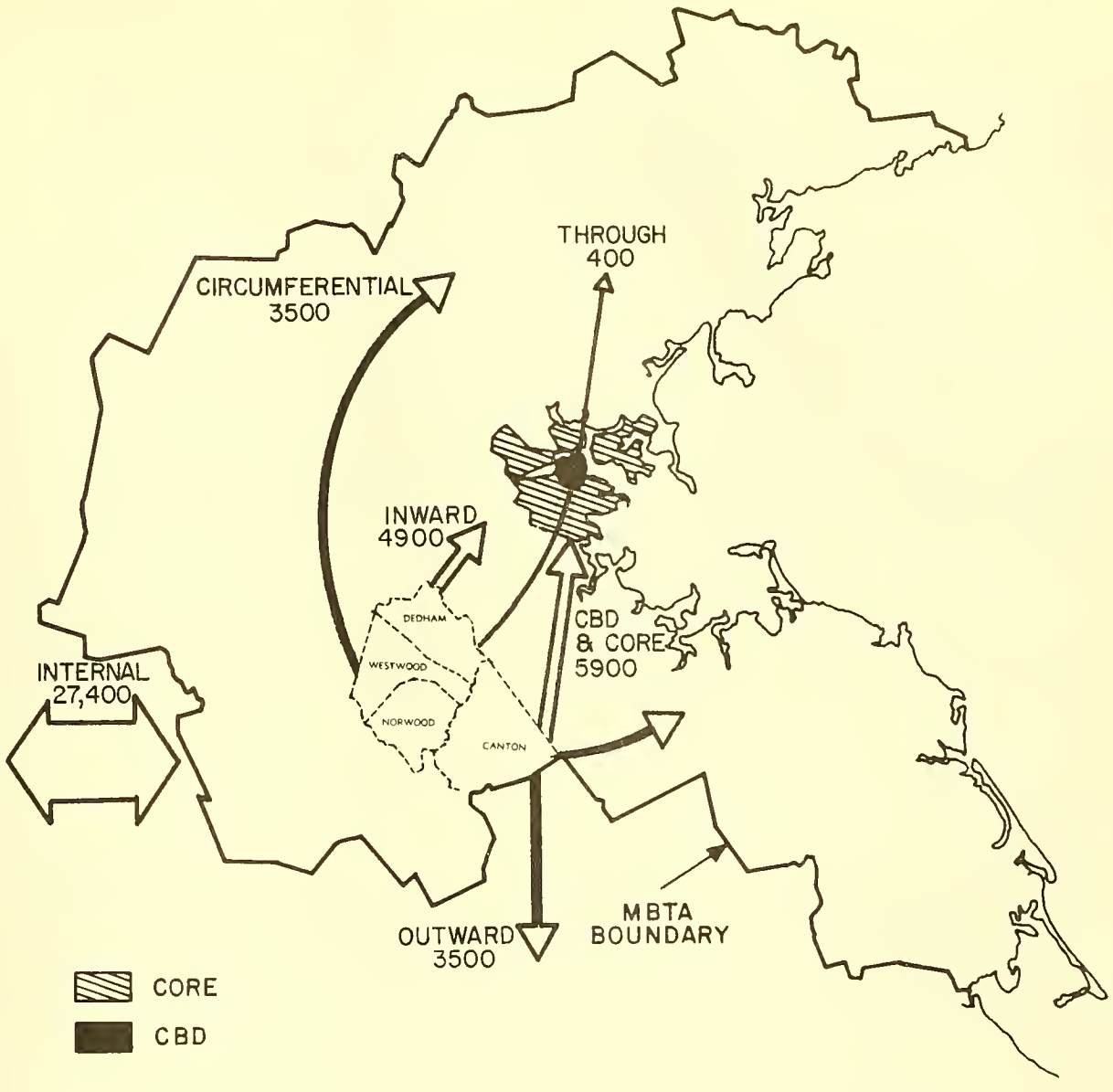
The residents of Canton are slightly wealthier than those of Dedham and Norwood, and the residents of Westwood are considerably wealthier than those of the other three towns. The percentage of elderly is similar for all four towns. Auto-ownership is considerably greater in Westwood than in the other towns. While Canton, Norwood, and Westwood show an increase in population by the year 1980, Dedham shows a decrease.

All four towns in zone 23 are served by the main Branch of the Penn Central Railroad. The zone is also served by Interstate 95, Route 1, and Route 128.

Forecasts for travel from zone 23 for 1980 show over 45,000 trips made during the A.M. peak period. Of these trips 60 percent are internal. About 13 percent are to the core, and more than 11 percent are inward with destination outside the core. Most of these trips have destinations before the core. Another 8 percent of the trips made during the A.M. peak period are circumferential, and more than 7 percent are outward.

Travel by transit to the core in 1980 is estimated by CTPS to represent 58 percent of the total morning peak period travel. Travel by all modes to the Boston CBD represents 56 percent of all trips to the core. About 65 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
CANTON	17,100	23,600	+38.0	882	7.3	$13,753	7.5	42.1	50.4
DEDHAM	26,938	26,000	- 3.3	2,497	9.6	$12,324	10.4	48.7	40.9
NORWOOD	30,815	33,100	+ 7.4	2,910	9.5	$12,606	11.5	50.5	38.0
WESTWOOD	12,750	16,000	+25.4	1,133	7.4	$17,334	2.9	39.0	58.1
TOTAL	87,603	98,700	+12.7	1,684	8.8	$13,446	9.2	46.8	44.0



TOTAL TRIPS 45,600

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	3,300	2,600	4,900	400	3,500	3,500	27,400	45,600
Percent of Total Peak Travel	7.2	5.7	10.7	0.9	7.7	7.7	60.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 23

5 Miles

Figure:

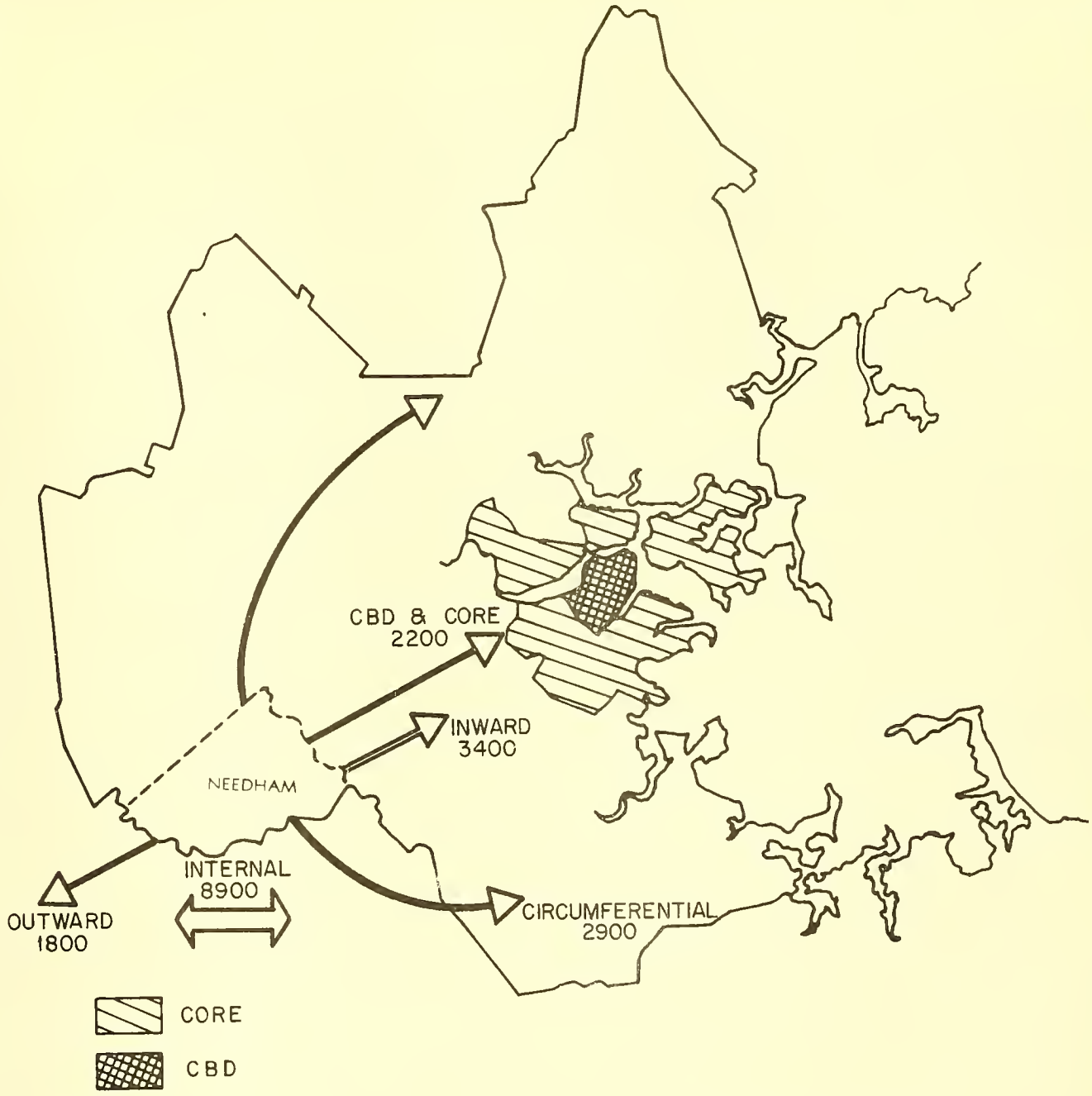
Zone 24 consists of the town of Needham. The CTPS estimate of 1980 population for zone 24 is 32,000. Needham is a moderate density, high income, residential community. Because of its proximity to Route 128, Needham is also an employment center. According to CTPS estimates, Needham will have experienced a moderate population growth by 1980.

Needham is served by a locally operated bus route. The Needham Branch of CONRAIL has four stations in Needham. The zone is served by Route 128.

Forecasts for travel from zone 24 for 1980, show over 19,000 trips made during the A.M. peak period. About 46 percent of these trips will internal to the zone. Over 11 percent will be to the core. Another 15 percent will be circumferential, and 9 percent will be outward. About 18 percent of the A.M. peak period travel will be inward with destinations outside the core.

Of the morning trips to the core, 54 percent are by transit. Trips with Boston CBD destinations represent 55 percent of all trips to the core. About 61 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households None	One	Two or Mor
NEEDHAM	29,748	32,000	+7.5	2,176	9.3	$16,375	5.3	40.2	54.5



TOTAL TRIPS 19,200

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,200	1,000	3,400	0	2,900	1,800	8,900	19,200
Percent of Total Peak Travel	6.2	5.3	17.7	0	15.1	9.4	46.3	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 24

2 Miles

Figure:

Zone 25 - Newton

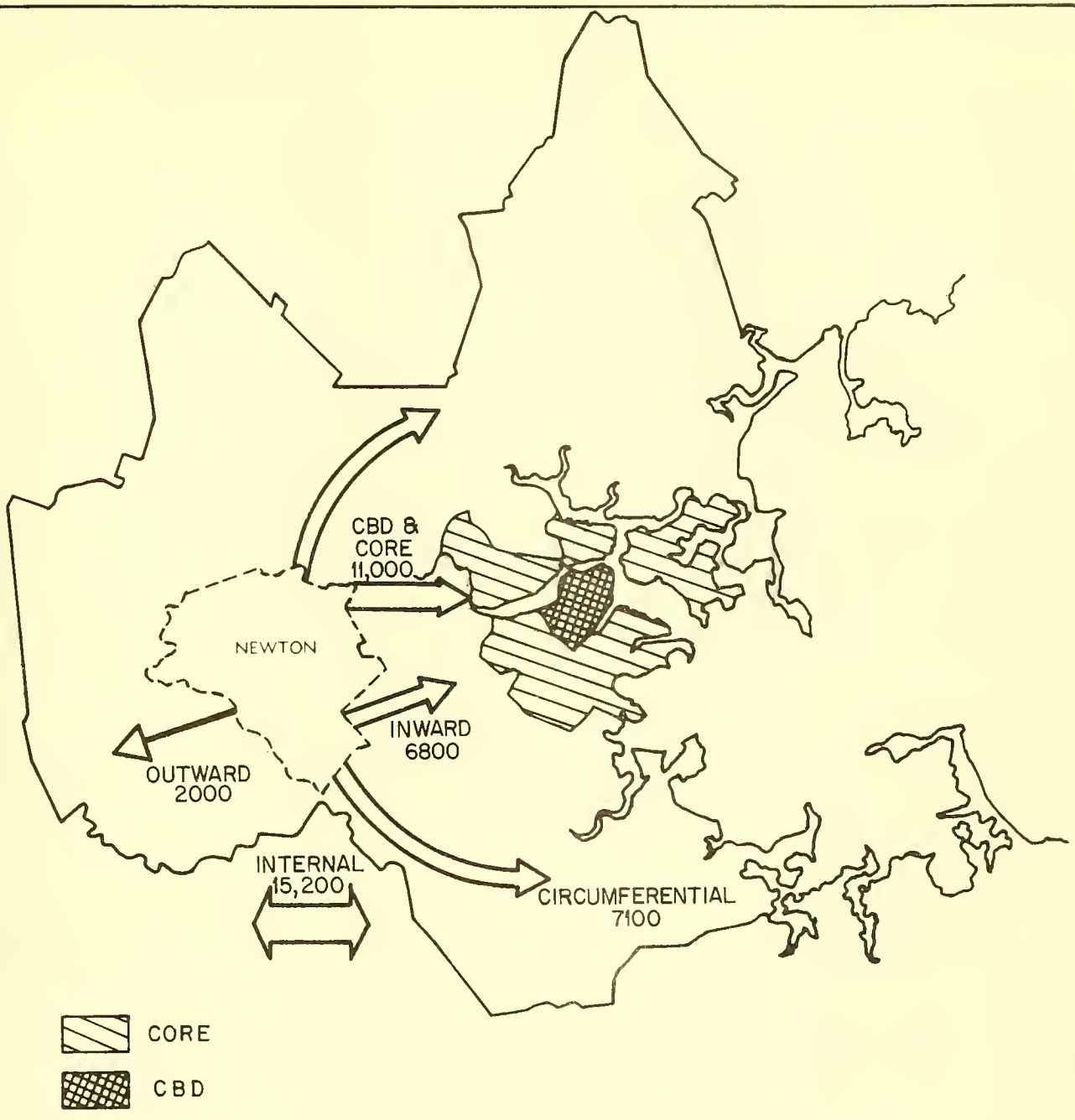
Zone 25 consists of the city of Newton. The CTPS estimate of 1980 population for zone 25 is 93,000. Newton is a high density, residential community. Because of its poximity to Route 128, Newton offers substantial employment opportunities. According to CTPS estimates, Newton will experience a small population increase between 1970 and 1980. Newton is also characterized as a high income residential community.

Newton is served by numerous highway arterials. These include Routes 90, 16, 128, 30, and 9. The zone is also served by branches of the Green Line. There is MBTA local and express bus service in Newton.

Forecasts for travel from zone 25 for 1980 show over 42,000 trips made during the A.M. peak period. Of these trips over 36 percent will be internal to the zone. Another 26 percent will be to the core. Over 16 percent will be inward with destinations outside the core. About 17 percent of the AM peak period travel will be circumferential, and another 5 percent will be outward.

Of the morning trips to the core, about 55 percent are by transit. Trips with Boston CBD destinations represent about 56 percent of all the trips to the core. About 61 percent of the trips to the Boston CBD are by transit

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households None	One	Two or More
NEWTON	91,066	93,000	+2.1	4,968	12.1	$15,381	9.0	47.1	43.9



TOTAL TRIPS 42,100

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	6,100	4,900	6,800	0	7,100	2,000	15,200	42,100
Percent of Total Peak Travel	14.4	11.6	16.2	0	16.9	4.8	36.1	100.0

1976
PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 25

2 Miles

Figure:

Zone 26 - Wellesley and Weston

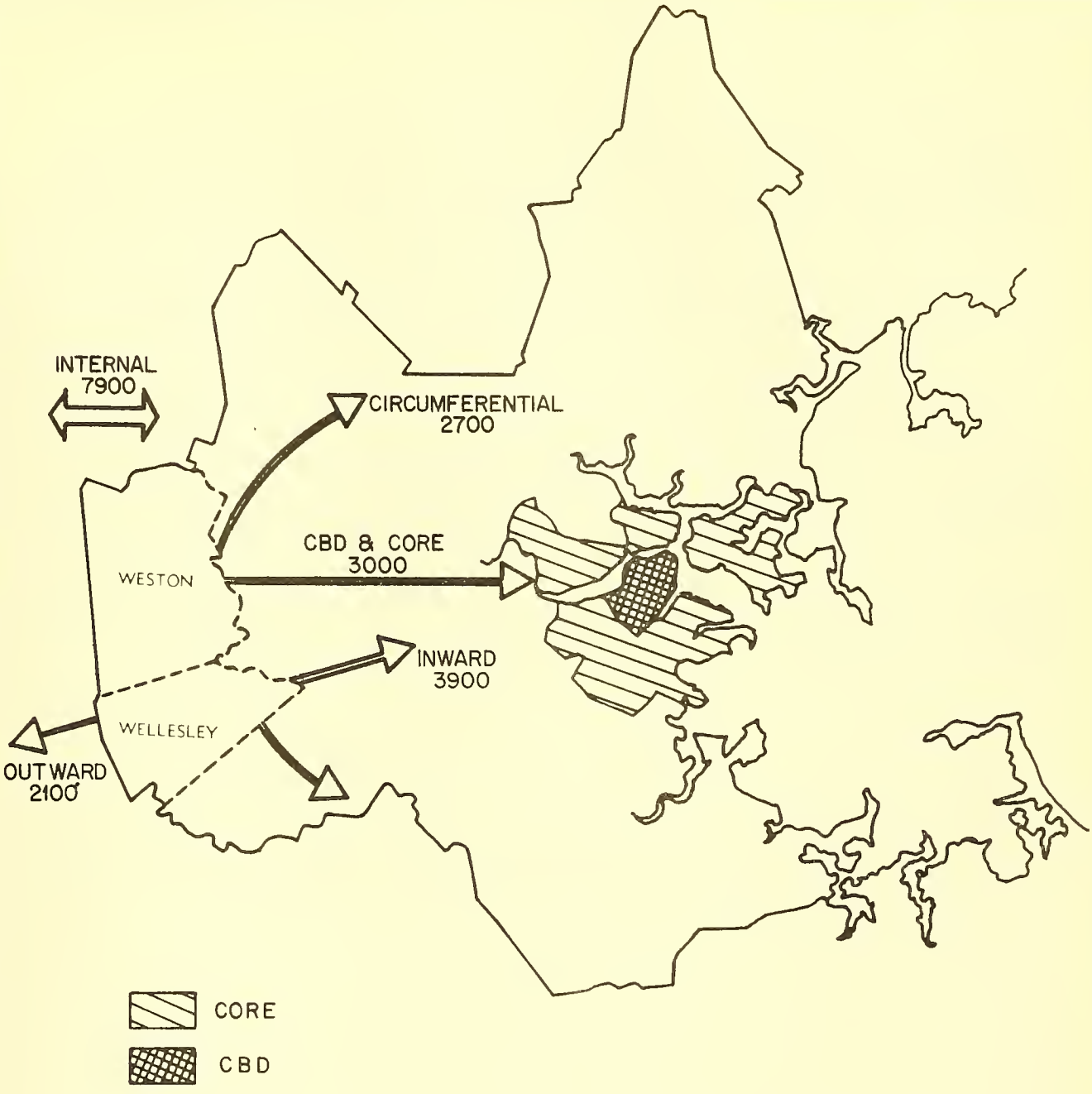
Zone 26 consists of the towns of Wellesley and Weston. The CTPS estimate of 1980 population for the towns in zone 26 is 43,500. Both towns are high-income, residential communities. Wellesley has a moderate population density. Because of its proximity to Route 128, Wellesley offers employment opportunities. Weston has a low population density. Both towns are growing. According to CTPS estimates, Weston is growing at a considerably greater rate than Wellesley is.

Wellesley is served by the Boston and Albany Main Line of CONRAIL and by private carrier bus service. Weston is served by the Fitchburg Division of the B&M Railroad. Highways serving zone 26 are Routes 9, 20, 30, and 128.

Forecasts for travel from zone 26 for 1980 show almost 20,000 trips made during the AM peak period. About 40 percent of these trips will be internal to the zone. Over 15 percent will be to the core. Another 20 percent of the A.M. peak period travel, will be inward with destinations outside the core. Approximately 14 percent of these trips will be circumferential, and 11 percent will be outward.

Of the morning trips to the core, about 48 percent are by transit. Trips with Boston CBD destinations represent 57 percent of all trips to the core. About 54 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
WELLESLEY	28,051	30,000	+ 0.9	2,669	10.8	$19,401	5.7	39.0	55.3
WESTON	10,870	13,500	+24.2	637	7.5	$23,539	0.9	28.3	70.8
TOTAL	38,921	43,500	+12.1	1,396	9.9	$22,388	4.5	36.2	59.3



TOTAL TRIPS 19,600

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,700	1,300	3,900	0	2,700	2,100	7,900	19,600
Percent of Total Peak Travel	8.7	6.6	19.9	0	13.8	10.7	40.3	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 26

2 Miles

Figure:

Zone 27 - Waltham

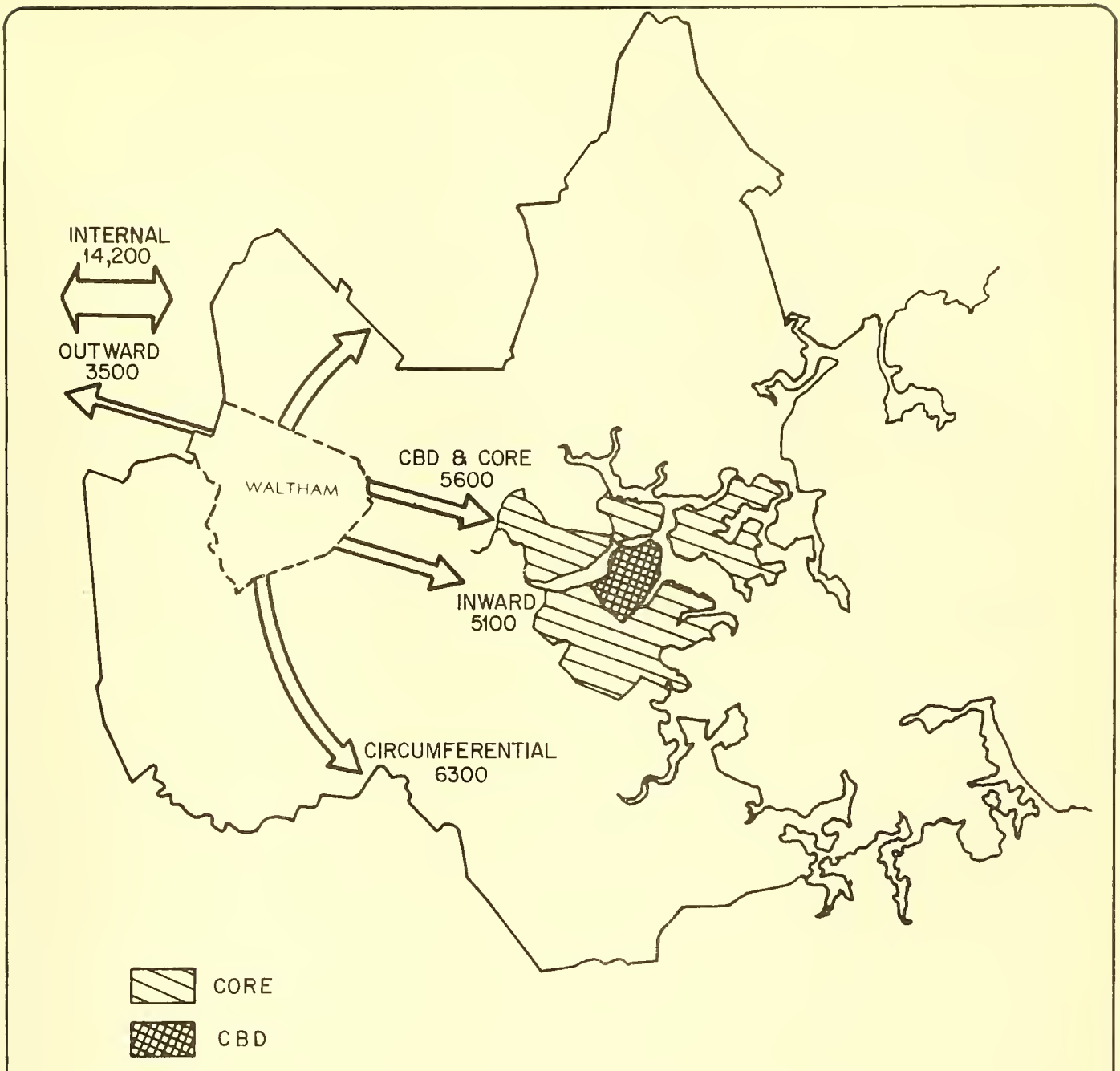
Zone 27 consists of the city of Waltham. The CTPS estimate of 1980 population, for Waltham is 65,000. Waltham is a community with older urban commercial centers. The zone offers a substantial number of employment opportunities. Waltham has a high population density. According to CTPS estimates, zone 27 will experience a small population increase by 1980.

Waltham is served by MBTA bus routes and by the Fitchburg division of the B&M Railroad. Zone 27 is served by Routes 128, 20, and 60.

Forecasts for travel from zone 27 for 1980, show about 35,000 trips made during the AM peak period. About 41 percent of these trips are internal to the zone. Over 16 percent will be to the core. Another 15 percent will be inward with destinations outside the core. Of the AM period travel, 18 percent will be circumferential, and 10 percen will be outward.

Of the morning trips to the core about 60 percent are by transit. Trips with Boston CBD destinations, represent 43 percent of all trips to the core. Another 65 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
WALTHAM	61,582	65,300	+6.0	4,555	+10.2	$11,523	16.1	55.8	28.1



TOTAL TRIPS 34,700

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	2,400	3,200	5,100	0	6,300	3,500	14,200	34,700
Percent of Total Peak Travel	6.9	9.2	14.7	0	18.2	10.1	40.9	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 27

2 Miles

Figure:

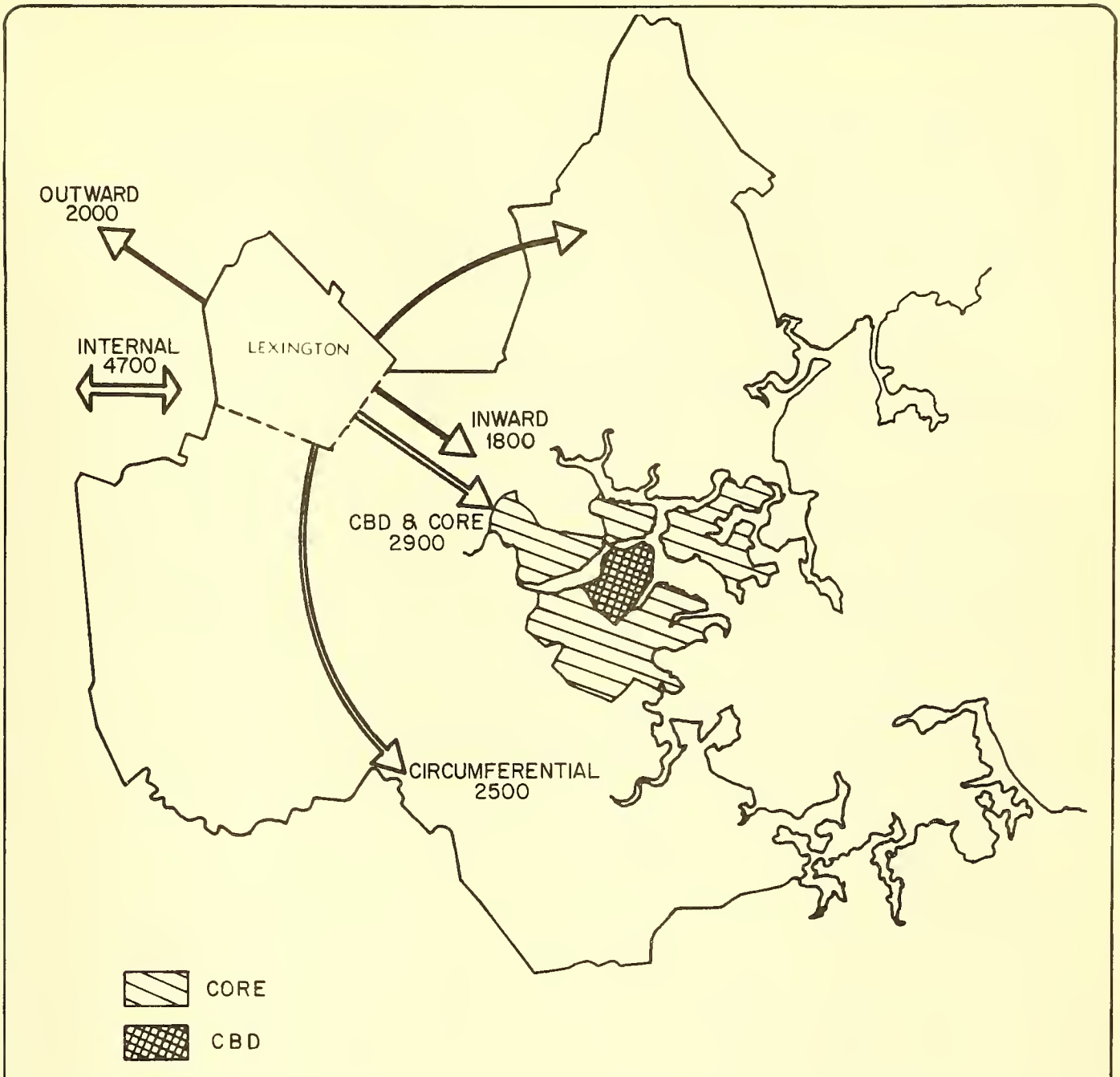
Zone 28 consists of the town of Lexington. The CTPS estimate of 1980 population for zone 28 is 35,500. Lexington is characterized as a high income, residential community. According to CTPS estimates, the town is growing at a moderate rate.

Zone 28 is served by the Fitchburg Division of the B&M Railroad. The MBTA operates a bus service in Lexington. Highway arterials serving Lexington include Route 2 and Route 128.

Forecasts for travel from zone 28 for 1980 show 14,000 trips made during the A.M. peak period. About 34 percent of these trips will be internal to the zone. Another 21 percent will be to the core. Of the AM peak period travel 13 percent will be inward with destinations outside the core. Over 14 percent will be outward, and 18 percent will be circumferential.

Of the morning trips to the core 44 percent are by transit. Trips with Boston CBD destinations represent about 45 percent of all trips to the core. About 53 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
LEXINGTON	31,886	35,500	+11.3	1,917	7.8	$17,558	4.7	37.3	57.4



TOTAL TRIPS 13,900

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,300	1,600	1,800	0	2,500	2,000	4,700	13,900
Percent of Total Peak Travel	9.3	11.5	13.0	0	18.0	14.4	33.8	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 28

2 Miles

Figure:

Zone 29 - Burlington - Winchester - Woburn

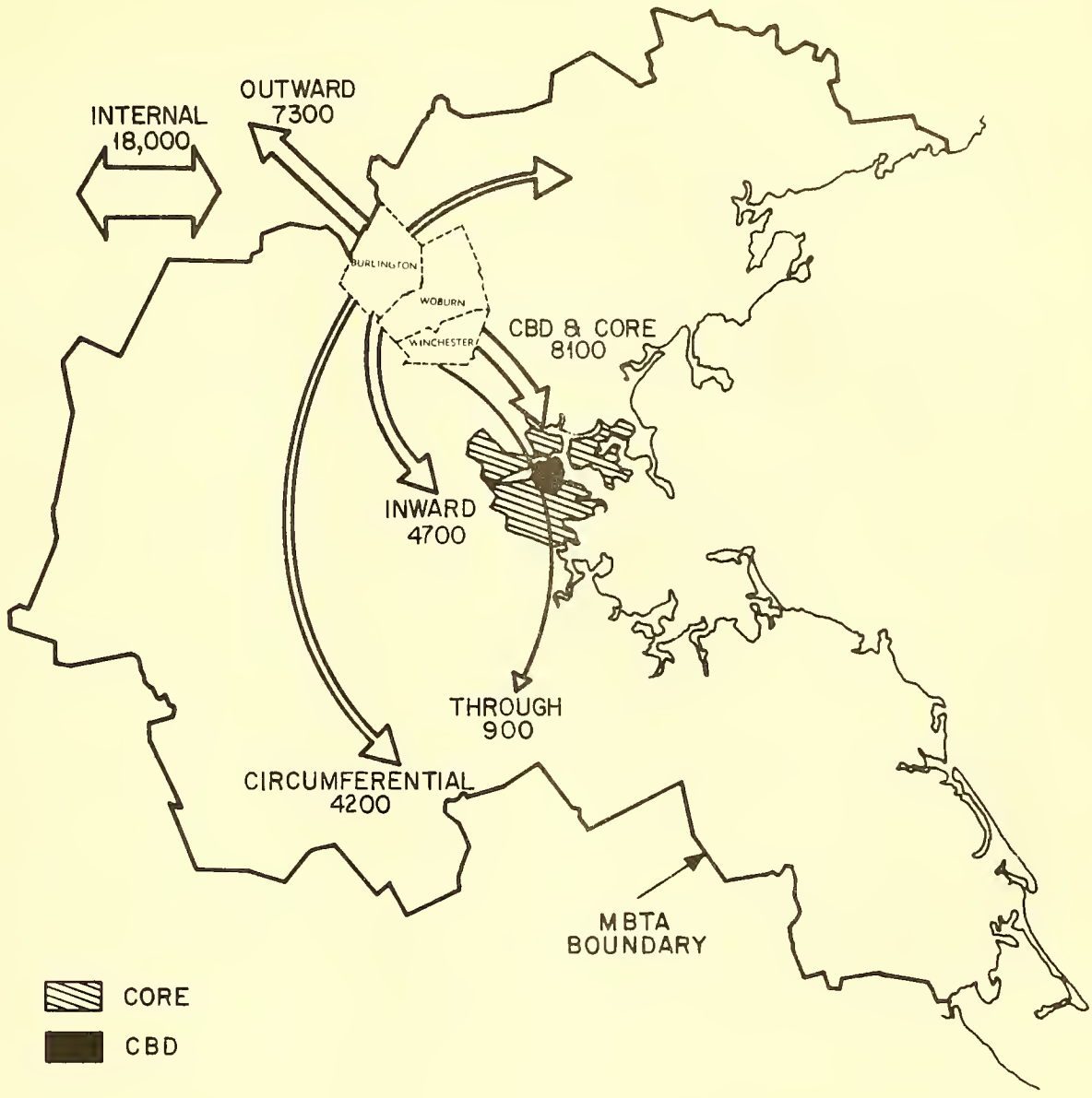
Zone 29 consists of Woburn and of the towns of Burlington and Winchester. The CTPS estimate of 1980 population for zone 29 is 93,000. Burlington is characterized as an employment center and as a retail center. All cities and towns in zone 29 have moderate population densities. They are all growing, according to CTPS estimates. Woburn is growing at a slower rate than either of the towns in zone 29. Median family income for Winchester is higher than income levels for Burlington or Woburn.

Woburn and Winchester are served by the New Hampshire Route and the Woburn Branch of the B&M Railroad. There are MBTA bus routes through each town and city in the zone. The highways serving zone 29 include Route 3, 93, and 128.

Forecasts for travel from zone 29 for 1980 show over 43,000 trips made during the AM peak period. About 42 percent of these trips are internal to the zone. Almost 19 percent will have destinations within the core. According to CTPS estimates, 11 percent of the AM peak period travel from zone 29 is inward with destinations outside the core. Over 2 percent of the morning trips will go through the core, about 10 percent will be circumferential, and 17 percent will be outward.

Of the morning trips to the core, about 50 percent are by transit. Trips with Boston CBD destinations represent about 57 percent of all trips to the core. About 59 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
BURLINGTON	21,980	26,500	+20.5	1,850	3.1	$13,236	2.1	47.2	50.7
WINCHESTER	22,269	23,500	+ 5.5	3,524	9.8	$16,639	6.9	42.5	50.6
WOBURN	37,406	42,900	+14.6	2,853	8.0	$11,748	10.5	55.4	34.1
TOTAL	81,655	92,900	+13.8	2,603	7.2	$14,432	7.4	49.8	42.8



TOTAL TRIPS 43,200

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	4,600	3,500	4,700	900	4,200	7,300	18,000	43,200
Percent of Total Peak Travel	10.7	8.1	10.9	2.1	9.6	16.9	41.7	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 29

5 Miles

Figure:

Zone 30 - Melrose, Stoneham, and Wakefield

Zone 30 consists of the city of Melrose and the towns of Stoneham and Wakefield. The CTPS estimate of population for the city and towns in zone 30 by 1980 is 87,000. Melrose is a high density residential community. Stoneham and Wakefield are moderate density residential communities. Wakefield, because of its proximity to Route 128, offers employment opportunities.

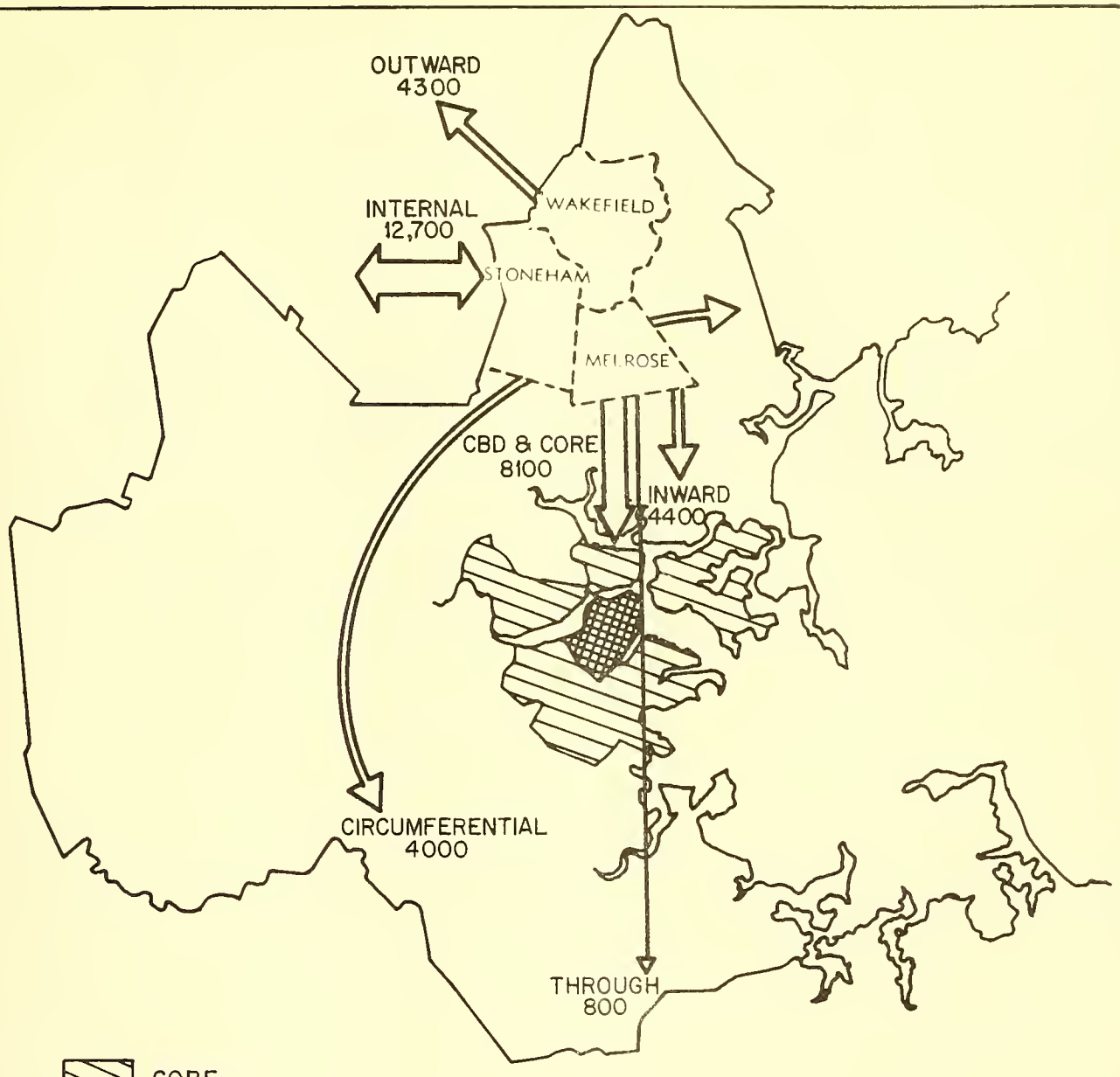
All three communities in the zone are growing, according to CTPS estimates. Melrose is an older community than either Wakefield or Stoneham. Melrose is growing at a slower rate than either of the towns in zone 30. The residents of all three communities have similar income and auto ownership characteristics.

All three communities in zone 30 are served by the Reading Branch of the B&M Railroad. Melrose is served by the Orange Line. The zone is also served by Interstate 93, Route 1, and Route 128.

Forecasts for travel from zone 30 for 1980 show over 34,000 trips made during the A.M. peak period. About 37 percent of these trips are internal to the zone. Over 23 percent are to the core. Another 15 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Over 11 percent of the morning peak trips are circumferential, and over 12 percent are outward.

Of the morning trips to the core, about 61 percent are by transit. Trips with Boston CBD destinations represent about 66 percent of all trips to the core. About 67 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
MELROSE	33,180	35,000	+ 5.4	6,913	12.8	$12,424	11.1	56.5	32.4
STONEHAM	20,725	23,500	+13.3	3,112	9.6	$12,281	10.2	55.4	34.4
WAKEFIELD	25,402	28,500	+12.2	3,220	11.3	$12,412	11.7	56.4	31.9
TOTAL	79,307	87,000	+ 9.7	4,098	11.5	$12,383	11.0	56.2	32.8



TOTAL TRIPS 34,300

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	5,300	2,800	4,400	800	4,000	4,300	12,700	34,300
Percent of Total Peak Travel	15.4	8.2	12.8	2.3	11.7	12.5	37.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 30

2 Miles

Figure:

Zone 31 - Lynnfield - Saugus

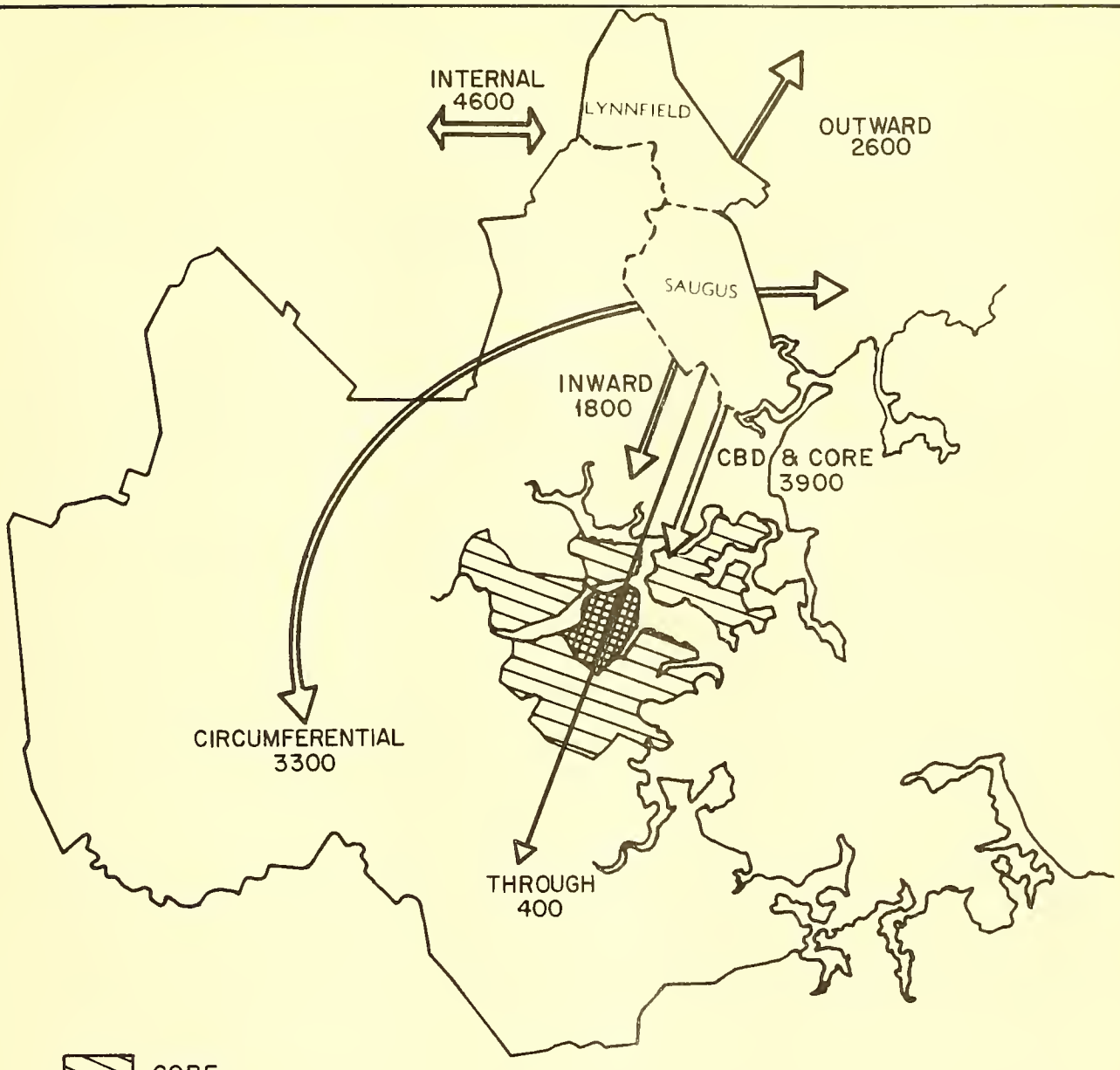
Zone 31 consists of the towns of Lynnfield and Saugus. The CTPS estimate of 1980 population for zone 31 is 42,000. Saugus is a moderate density residential community. Lynnfield has lower density than Saugus. Lynnfield is a high-income, residential community. Both towns in zone 31 are growing, according to CTPS estimates.

Saugus is served by MBTA bus service. The zone is served by Route 128 and Route 1.

Forecasts for travel from zone 31 show 17,000 trips made during the A.M. peak period. Almost 28 percent of these trips will be internal to the zone. About 23 percent will be to the core. According to CTPS estimates, 11 percent of the AM peak period travel will be inward with destinations outside the core. Another 20 percent will be circumferential, about 16 percent will be outward, and over 2 percent will pass through the core.

Of the morning trips to the core 59 percent are by transit. Trips with Boston CBD destinations represent about 62 percent of the total trips to the core. About 66 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
LYNNFIELD	10,826	13,200	+21.9	1,032	6.4	$16,242	3.3	35.6	61.1
SAUGUS	25,110	29,000	+15.4	2,168	8.6	$11,541	6.4	57.0	36.6
TOTAL	35.936	42,200	+17.6	1,628	7.9	$12,956	5.5	50.8	43.7



TOTAL TRIPS 16,600

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	2,400	1,500	1,800	400	3,300	2,600	4,600	16,600
Percent of Total Peak Travel	14.5	9.0	10.8	2.4	19.9	15.7	27.7	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 31

2 Miles

Figure:

Zone 32 - Lynn, Marblehead, Nahant, and Swampscott

The city of Lynn and the towns of Marblehead, Nahant, and Swampscott form zone 32. The total population for zone 32 by 1980 will be about 130,000 according to CTPS estimates. The city of Lynn is an older urban center of employment and retail opportunities. The city has a high population density. The towns of Marblehead, Nahant, and Swampscott are residential communities with moderate population densities.

The income and auto ownership characteristics of the population of Lynn differ considerably from the characteristics of the three towns in zone 32. Median income and auto ownership levels for Lynn fall below the regional average. The towns of Marblehead, Nahant, and Swampscott have income levels and auto ownership levels above the average for the region.

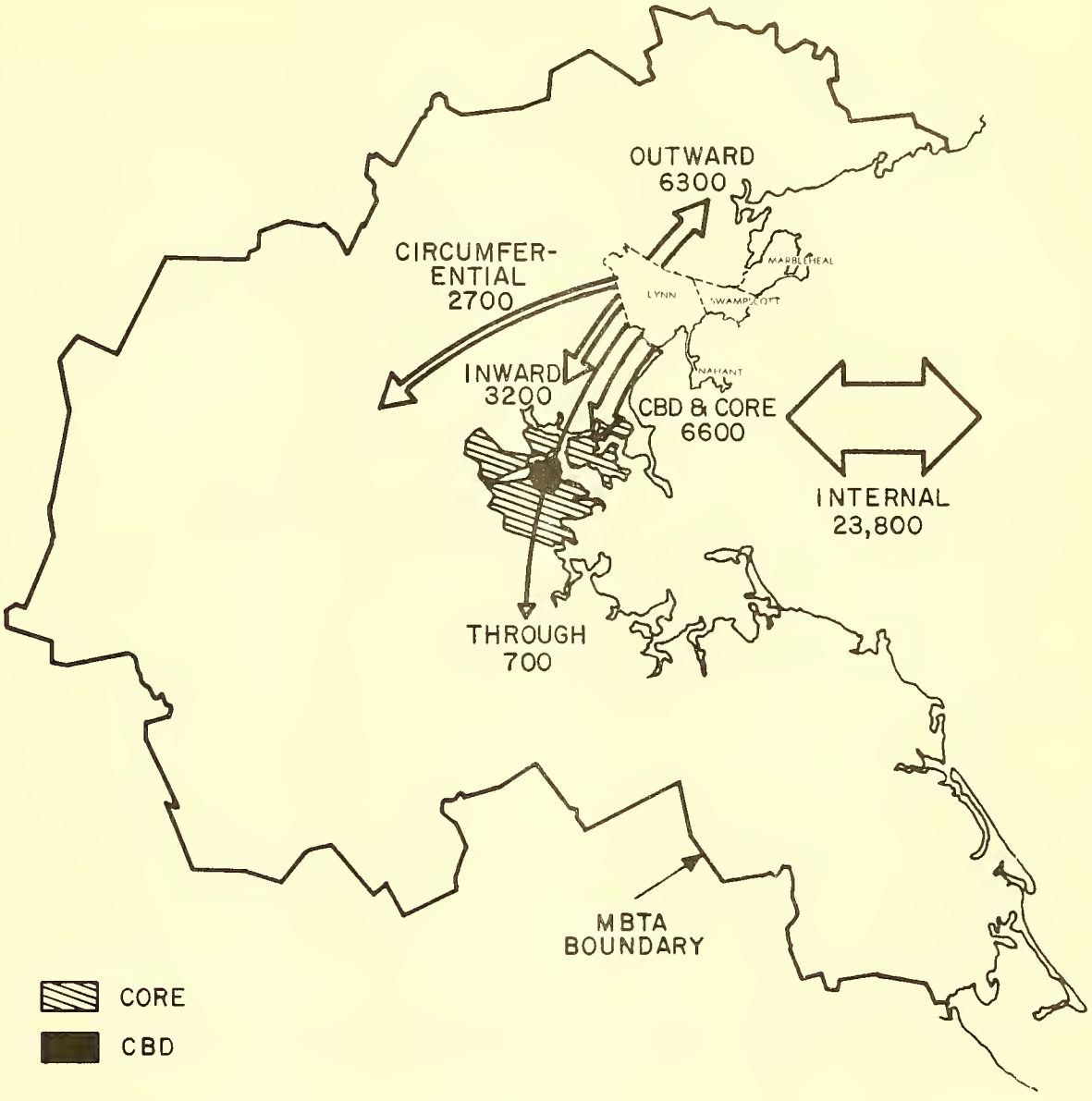
According to CTPS estimates, zone 32 will experience negligible population growth over the period from 1970 to 1980. The limited growth of zone 38 that does take place over this time period will occur in Swampscott.

The city and the towns in zone 32 are served by the Eastern Route of the B&M Railroad. The bus service offered by the MBTA to the communities in zone 32 feeds into Lynn from the three towns and links Lynn with the inner North Shore communities and Boston. The communities in the zone are served by Routes 1A, 107, 114, and 129.

The CTPS forecasts for travel from zone 32 for 1980 show about 43,000 trips being made during the A.M. peak period. About 55 percent of these trips are internal to the zone. Almost 15 percent of the trips are to the core, and about 9 percent are inward with destinations other than the core. About 6 percent of the trips are circumferential, and about 14 percent are outward.

Of the morning trips to the core in 1980, about 62 percent are estimated to be by transit. Trips to the Boston CBD represent 55 percent of the total travel to the core. About 67 percent of the travel to the Boston CBD is estimated to be by transit in 1980.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
LYNN	90,294	89,500	0.0	8,055	14.3	$ 9,709	28.9	52.9	18.2
MARBLEHEAD	21,295	21,200	0.0	4,817	12.2	$14,222	8.8	41.0	50.2
NAHANT	4,119	4,200	+1.9	3,886	10.8	$12,656	6.8	54.8	38.4
SWAMPSCOTT	13,578	14,900	+9.7	4,380	12.9	$13,642	12.0	46.2	41.8
TOTAL	129,286	129,800	+0.4	6,532	12.9	$11,006	23.4	50.3	26.3



TOTAL TRIPS 43,300

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	3,600	3,000	3,200	700	2,700	6,300	23,800	43,300
Percent of Total Peak Travel	8.3	6.9	7.4	1.6	6.2	14.5	55.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 32

5 Miles

Figure:

Zone 33 - Danvers, Middleton, Peabody, and Salem

Zone 33 consists of the towns of Danvers and Middleton and the cities of Peabody and Salem. The CTPS estimates the growth rate of the population in this zone to be more than 10 percent for ten years since 1970. According to these estimates, the population will reach 131,000 by 1980. Salem is a residential community with employment opportunities. Salem is a mature community. It has the highest population density and the lowest projected rate of growth of all towns in zone 33. Danvers and Peabody are moderate density residential communities. Middleton is a low density residential community, and it is rural in character.

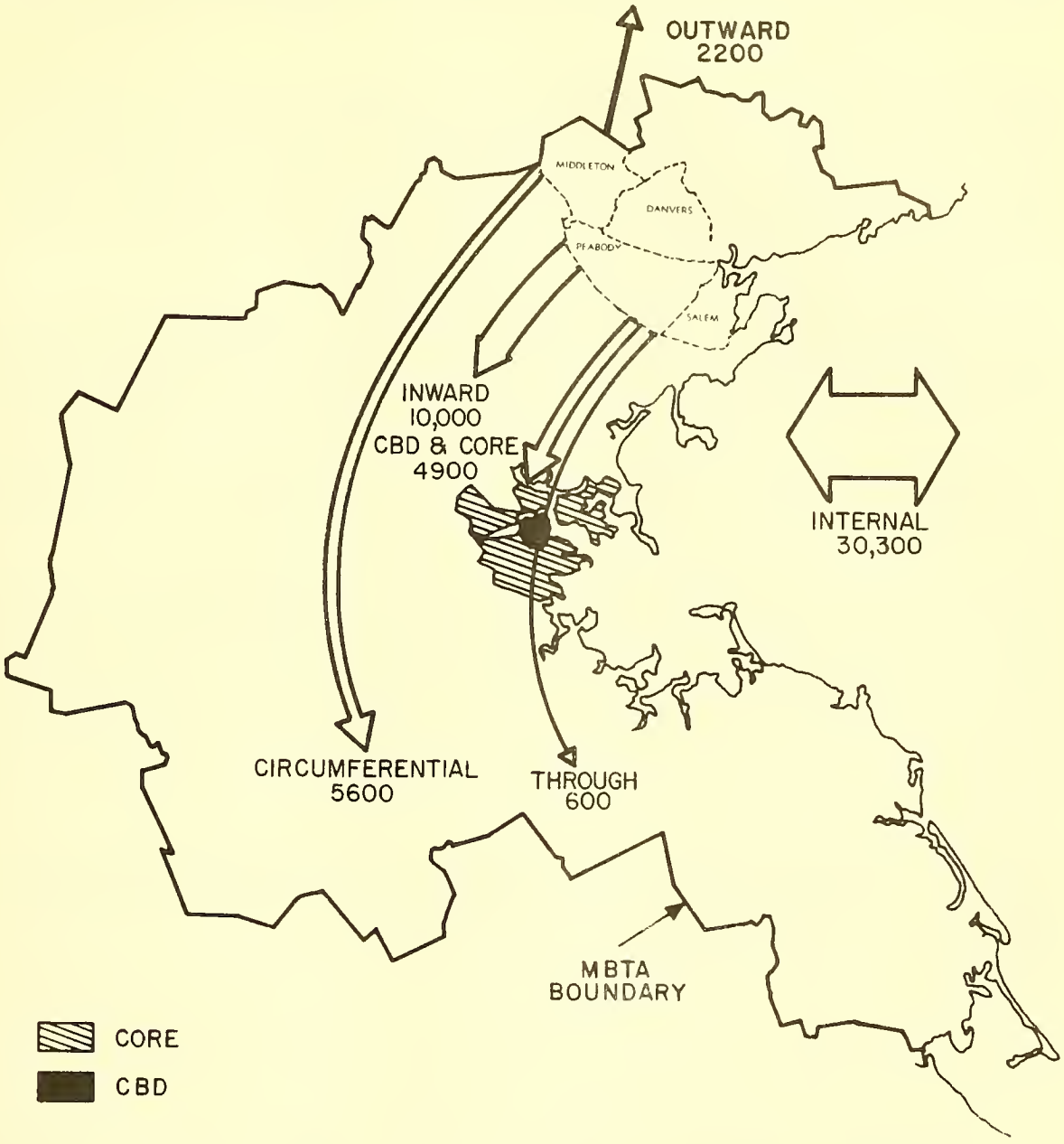
The 1970 median income of the residents of Salem is at a lower level than income for residents of the other cities and towns in this zone. Auto ownership in Salem is lower than the ownership levels for Danvers, Peabody, and Middleton. Over 90 percent of households of Danvers and Middleton have at least one automobile. About 75 percent of the households in Salem own at least one automobile.

Salem is served by the Newburyport Branch and Rockport Branch of the B&M Railroad. The zone is also served by Interstate 95, Route 1 and Route 128.

Forecasts of travel from zone 33 for 1980 show over 53,000 trips made during the A.M. peak period. About 57 percent of these trips are internal to the zone. Only 9 percent are to the core. Another 20 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Over 10 percent of the morning peak trips are circumferential, and only 4 percent are outward.

Of the morning trips to the core, about 56 percent are by transit. Trips with Boston CBD destinations represent about 53 percent of all trips to the core. About 62 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
DANVERS	26,151	30,500	+16.6	1,890	10.2	$12,156	7.8	50.8	41.4
MIDDLETON	4,044	5,000	+20.6	280	11.1	$11,037	4.8	55.6	39.6
PEABODY	48,080	54,000	+12.6	2,860	8.1	$11,620	11.6	49.1	39.3
SALEM	40,566	41,500	+ 2.3	4,959	12.9	$ 9,961	25.4	56.0	18.6
TOTAL	118,841	131,000	+10.23	2,149	10.3	$11,140	15.9	52.2	31.9



TOTAL TRIPS 53,600

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	2,600	2,300	10,000	600	5,600	2,200	30,300	53,600
Percent of Total Peak Travel	4.8	4.3	18.7	1.1	10.5	4.1	56.5	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 33

5 Miles

Figure:

Zone 34 - Beverly, Hamilton, Manchester, Topsfield, and Wenham

Zone 34 consists of the city of Beverly and the towns of Hamilton, Manchester, Topsfield, and Wenham. Beverly is a moderate density residential community. The rest of the towns are very low density residential communities, and they are rural in character. The growth rate in this zone is projected by CTPS to be high, as much as 23 percent over a ten year period. The estimated population in 1980 will be 72,000.

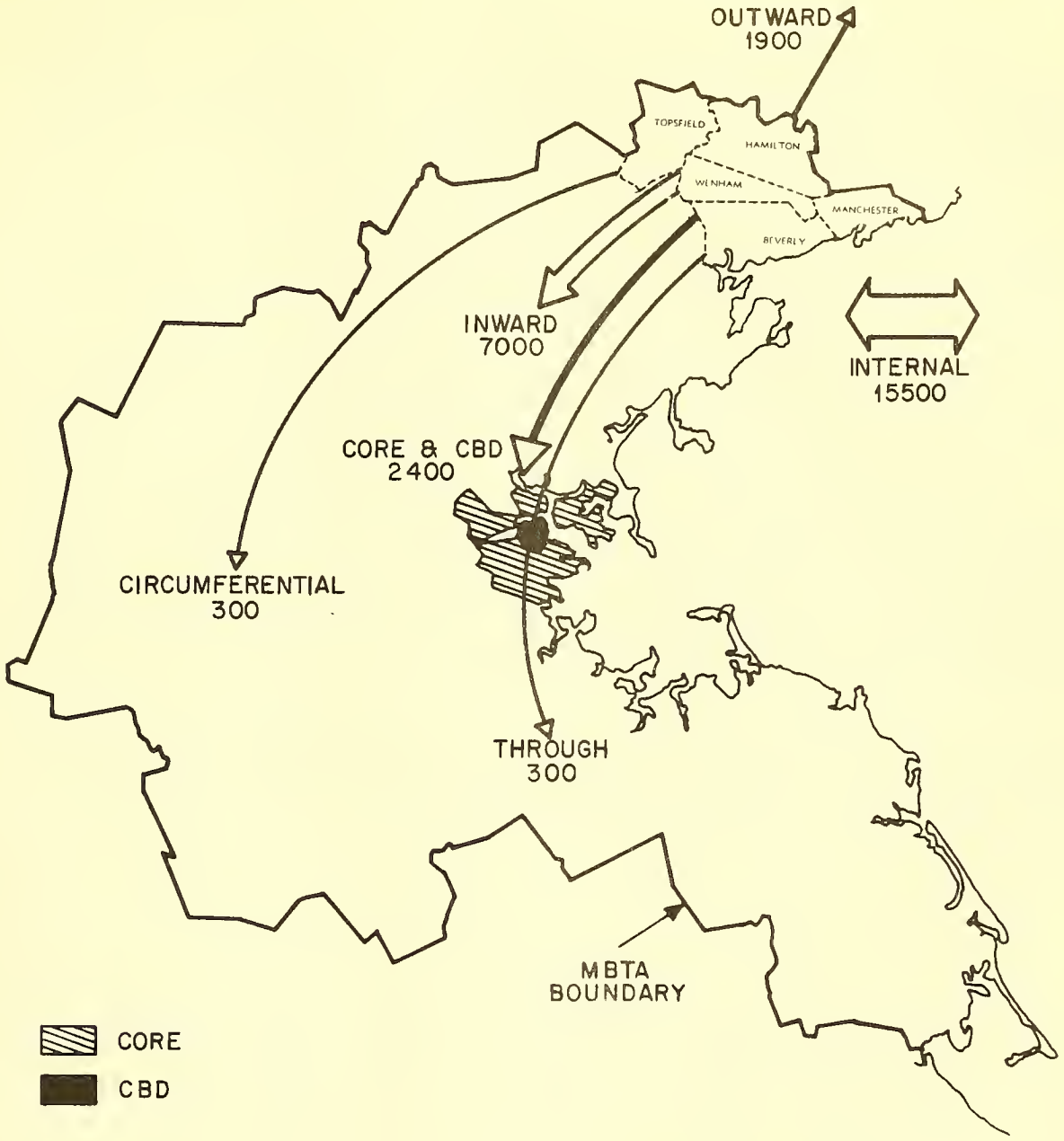
Topsfield and Wenham are high income residential communities. Over 85 percent of the households in these towns own at least one automobile. The residents of Beverly, Hamilton and Manchester have similar income characteristics. Income levels for these three communities can be characterized as moderate.

All five communities in zone 34 are served by the Rockport Branch and Newburyport Branch of the B&M Railroad. The zone is also served by Interstate 95 and Route 128.

Forecasts for travel from zone 30 for 1980 show over 27,000 trips made during the A.M. peak period. More than half of the trips are internal to the zone. Only 9 percent are to the core. Over 26 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. About 1 percent of the morning peak trips are circumferential, and 7 percent are outward.

Of the morning trips to the core, about 50 percent are by transit. Trips with Boston CBD destinations represent about 54 percent of all trips to the core. About 56 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
BEVERLY	38,348	45,600	+16.9	2,497	9.9	$11,292	16.0	50.7	33.3
HAMILTON	6,373	8,500	+33.3	425	8.5	$12,797	5.3	37.1	57.6
MANCHESTER	5,151	6,500	+26.2	667	10.3	$11,166	9.2	43.0	47.8
TOPSFIELD	5,225	7,000	+33.9	406	5.0	$16,350	1.6	27.9	70.5
WENHAM	3,849	4,800	+24.7	469	6.7	$14,216	3.1	39.3	57.6
TOTAL	58,946	72,400	+22.8	996	9.1	$12,059	12.5	46.5	41.0



TOTAL TRIPS 27,400

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,300	1,100	7,000	300	300	1,900	15,500	27,400
Percent of Total Peak Travel	4.7	4.0	25.5	1.1	1.1	6.9	56.7	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 34

5 Miles

Figure:

Zone 35 consists of the towns of North Reading, Reading, and Wilmington. The CTPS estimate of 1980 population for the towns in zone 35 is 63,000. Reading is a moderate density, residential community. North Reading and Wilmington are low density, residential communities.

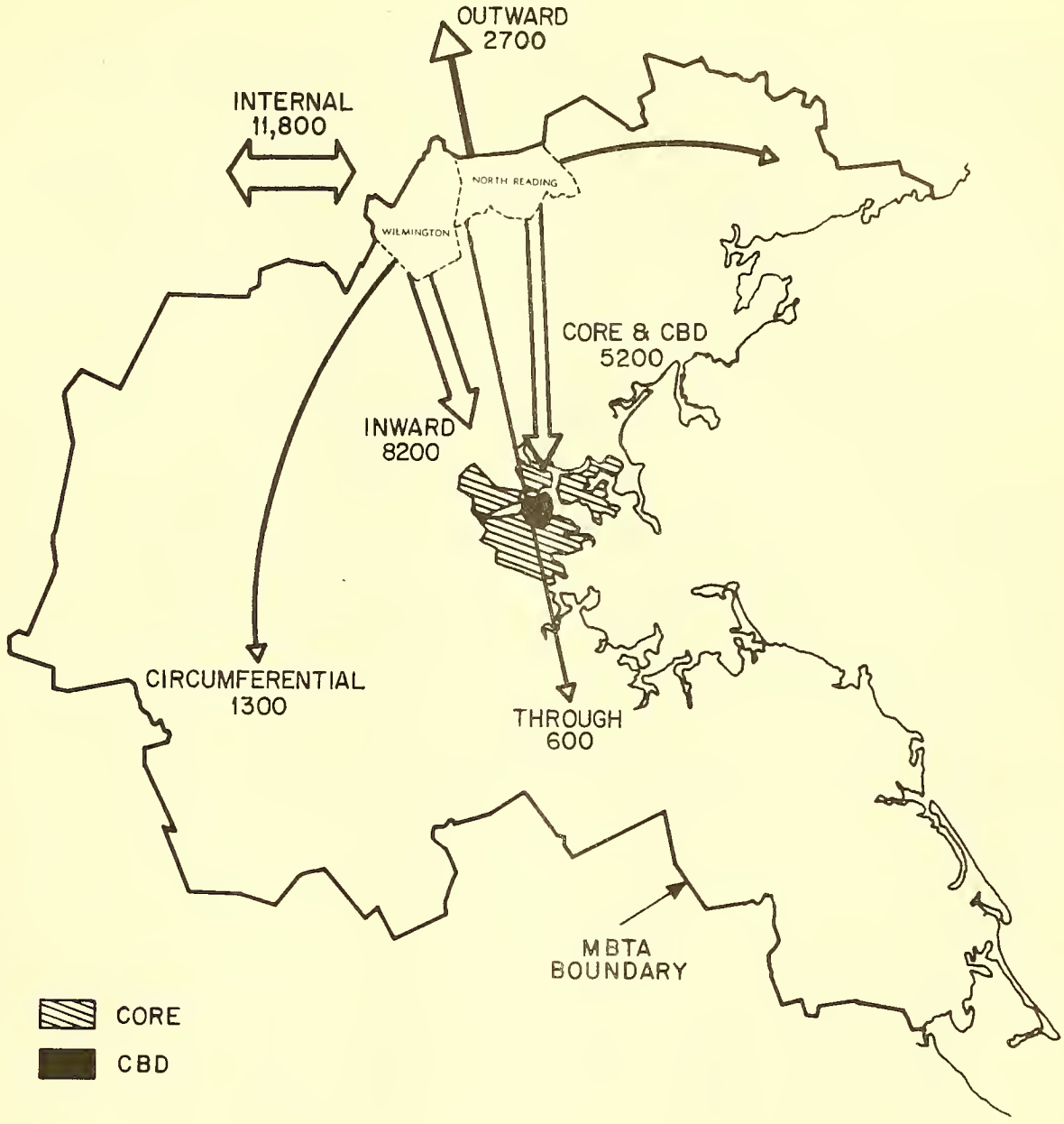
All three towns are experiencing substantial growth. Reading is growing at a slower rate than either of the other towns in zone 35. The residents of all three towns have similar income and auto ownership characteristics.

The towns in the zone are served by Haverhill Branch, Lowell Branch and Reading Branch of the B&M Railroad. The zone is also served by Interstate 93 and Route 128.

Forecasts for travel from zone 35 for 1980 show over 30,000 trips made during the A.M. peak period. Over 39 percent of these trips are internal to the zone. About 17 percent are to the core. Another 30 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Less than 5 percent of the morning peak trips are circumferential, and about 9 percent are outward.

Of the morning trips to the core, about half of them are by transit. Trips with Boston CBD destinations represent about 60 percent of all trips to the core. About 58 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
NORTH READING	11,264	14,000	+24.2	627	5.6	$12,485	4.9	45.9	49.2
READING	22,539	25,800	+14.4	2,228	8.7	$13,494	7.9	47.3	44.8
WILMINGTON	17,102	23,000	+34.4	999	5.4	$11,713	6.5	54.3	40.2
TOTAL	50,905	62,800	+23.4	1,256	6.9	$12,690	6.8	49.0	44.2



TOTAL TRIPS 29,800

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	3,100	2,100	8,200	600	1,300	2,700	11,800	29,800
Percent of Total Peak Travel	10.4	7.0	27.5	2.0	4.4	9.1	39.6	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 35

5 Miles

Figure:

Zone 36 - Bedford, Concord and Lincoln

Zone 36 consists of the towns of Bedford, Concord, and Lincoln. The CTPS estimate of 1980 population for the towns in zone 36 is 47,000. All three towns are growing at the same rate - 24% in ten years.

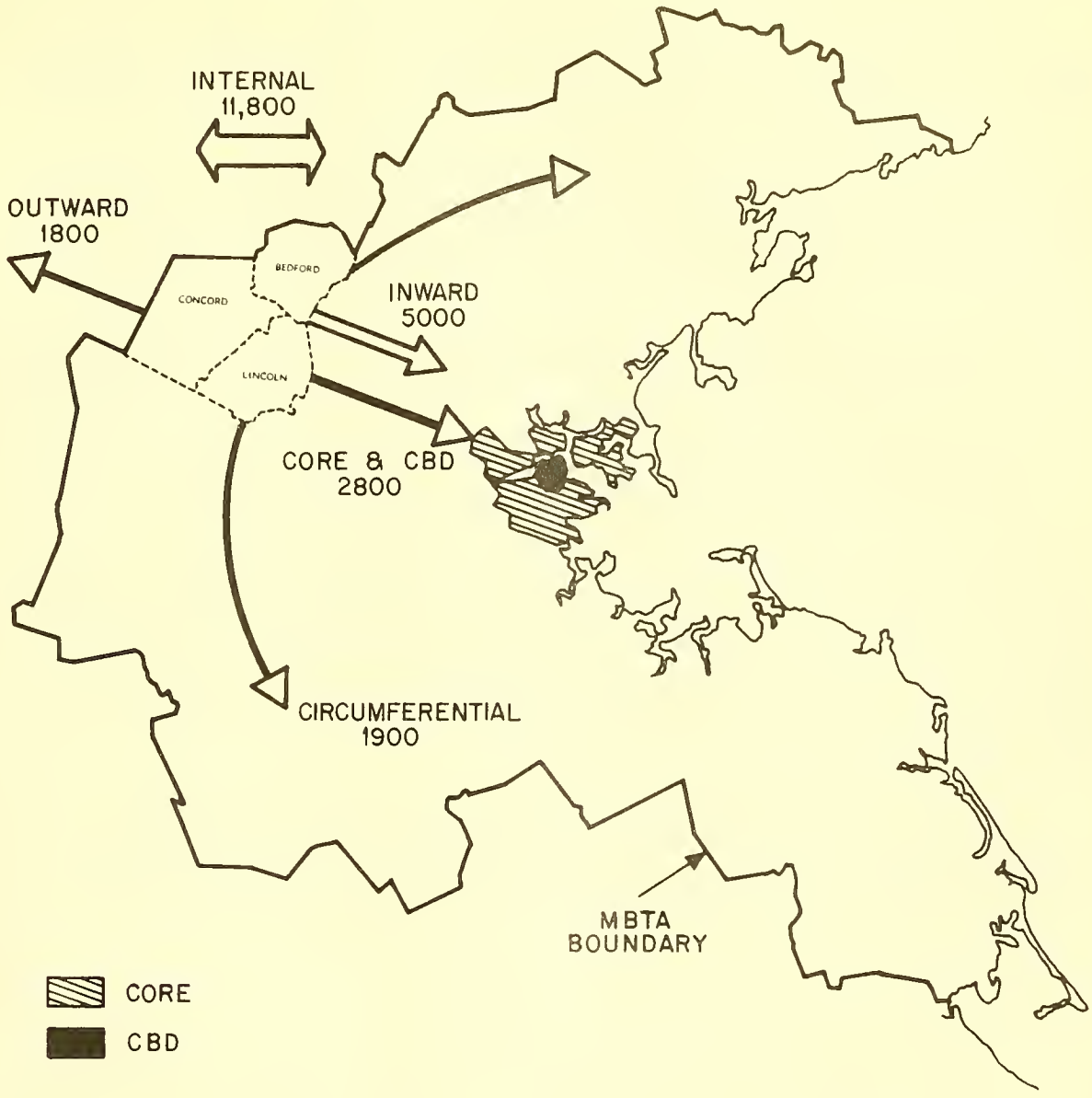
Concord and Lincoln are high income, residential communities. Bedford and Concord have low population densities. Lincoln is rural in character. Over 95% of the households in this zone own at least one automobile. Less than 10 percent of the residents is elderly.

All three towns in zone 36 are served by the Bedford Branch and Fitchburg Division of the B&M Railroad. The zone is also served by Route 2, Route 3, and Route 128.

Forecasts for travel from zone 36 for 1980 show over 23,000 trips made during the A.M. peak period. About 50 percent of these trips are internal to the zone. Over 12 percent are to the core. Another 21 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Over 8 percent of the morning peak trips are circumferential, and about 8 percent are outward.

Of the morning trips to the core, about 40% are by transit. Trips with Boston CBD destination's represent about 46 percent of all trips to the core. About 47 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
BEDFORD	13,513	17,000	+25.9	976	6.3	$14,271	3.0	40.4	46.6
CONCORD	16,148	20,000	+23.8	627	8.6	$16,463	6.3	38.2	55.5
LINCOLN	7,567	9,500	+25.5	507	4.5	$17,361	1.6	38.6	59.8
TOTAL	37,228	46,500	+24.9	682.6	6.9	$15,744	4.0	40.6	55.4



TOTAL TRIPS 23,300

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,300	1,500	5,000	0	1,900	1,800	11,800	23,300
Percent of Total Peak Travel	5.6	6.4	21.5	0	8.2	7.7	50.6	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 36

5 Miles

Figure:

Zone 37 - Maynard, Sudbury and Wayland

Zone 37 consists of the towns of Maynard, Sudbury, and Wayland. Maynard is a moderate density, redidential community. Sudbury and Wayland are low density, residential communities. Maynard is an employment center.

The population in this zone is about 37,000. All three towns in the zone are growing. Sudbury is growing in a very fast rate - as high as 70 per cent in ten years. The CTPS estimate of 1980 population for the towns in zone 37 is 53,000.

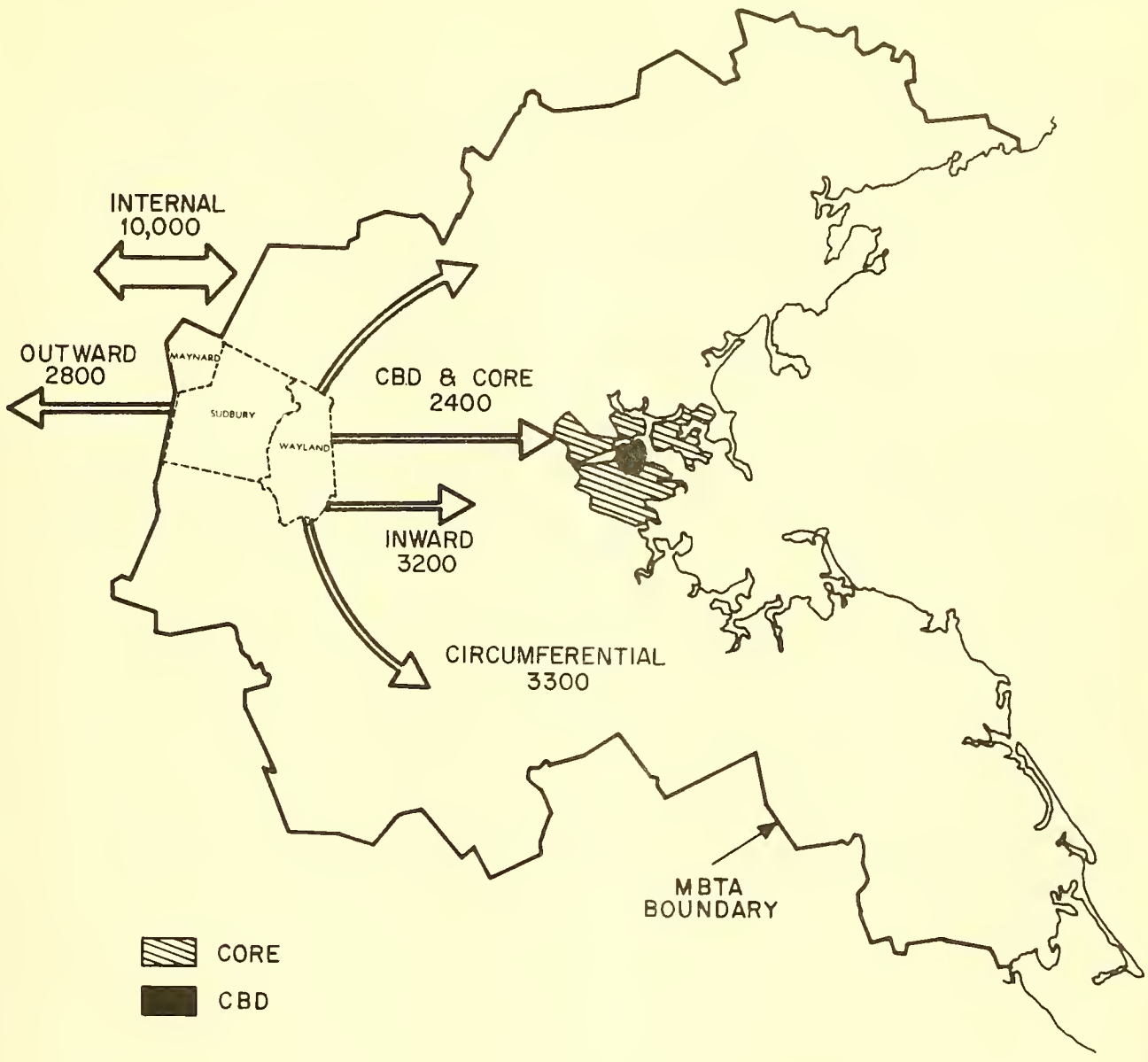
Sudbury and Wayland are high income, residential communities. Over 95 percent of the households in these two towns own at least one automobile .

All three towns in the zone are served by Route 20 and by some private carriage bus services.

Forecasts for travel from zone 37 for 1980 show over 22,000 trips made during the A.M. peak period. About 46 percent of these trips are internal to the zone. Only 11 percent are to the core. Another 15 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Over 15 percent of the morning peak trips are circumferential, and about 13 percent are outward.

Of the morning trips to the core, about 38 percent are by transit. Trips with Boston CBD destinations represent about 50 percent of all trips to the core. About 45 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
MAYNARD	9,710	10,500	+ 8.1	1,815	10.2	$10,665	15.7	52.4	31.9
SUDBURY	13,506	23,000	+70.2	551	3.5	$17,798	2.1	22.3	75.6
WAYLAND	13,461	19,000	+41.1	848	5.9	$17,755	3.6	29.2	67.7
TOTAL	36,677	52,500	+43.1	802	6.2	$15,791	6.6	34.0	59.4



TOTAL TRIPS 21,700

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	1,200	1,200	3,200	0	3,300	2,800	10,000	21,700
Percent of Total Peak Travel	5.5	5.5	14.8	0	15.2	12.9	46.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 37

5 Miles

Figure:

Zone 38 - Ashland, Framingham, Natick, and Sherborn

Zone 38 consists of the towns of Ashland, Framingham, Natick, and Sherborn. The CTPS estimate of 1980 population for the towns in zone 38 is 118,000. Framingham is a populous residential center with retail opportunities and is also an employment center. Sherborn is a high income residential community that is rural in character. The other three towns in zone 38 have similar income and auto-ownership characteristics. Framingham and Natick have higher population densities than Sherborn and Ashland have.

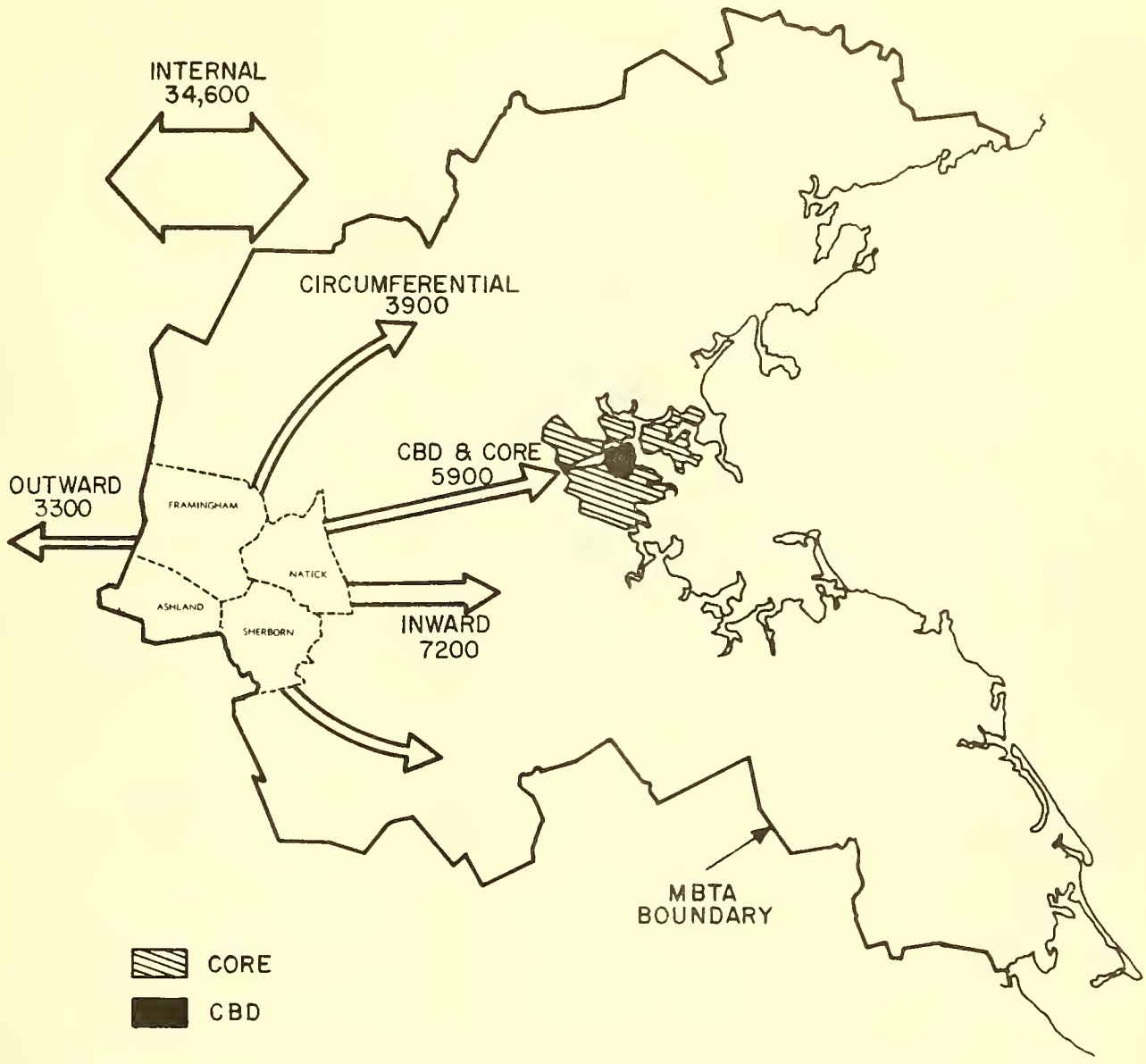
All four towns in zone 38 are growing according to CTPS estimates. Sherborn is growing at a much faster rate than any of the other three towns.

Framingham and Natick are served by the Boston and Albany Main Line of CONRAIL, by private bus carriers, by Route 9, and by Interstate 90. Sherborn and Natick are served by Route 16 and by Interstate 90. Route 135 also serves the towns in the zone.

Forecasts for travel from zone 38 for 1980 show about 55,000 trips made during the A.M. peak period. More than 63 percent of these trips will be internal to the zone. About 11 percent are to the core, and 13 percent are inward with destination outside the core. About 7 percent of these trips are circumferential, and 6 percent are outward.

Of the morning trips to the core in 1980, about 46 percent are estimated to be by transit. Trips with Boston CBD destinations, represent 58 percent of all trips to the core. About 50 percent of the trips destined to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
ASHLAND	8,882	10,500	+18.2	685	6.2	$12,148	10.3	46.1	43.6
FRAMINGHAM	54,048	68,000	+ 6.1	2,349	8.5	$13,090	10.2	46.3	43.5
NATICK	31,057	34,000	+ 9.4	1,942	8.1	$13,144	8.7	48.5	43.8
SHERBORN	3,309	5,500	+66.2	215	6.2	$17,833	1.6	24.6	73.8
TOTAL	97,296	118,000	+21.3	1,340	8.1	$13,136	9.4	46.1	44.5



Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	3,400	2,500	7,200	0	3,900	3,300	34,600	54,900
Percent of Total Peak Travel	6.2	4.5	13.1	0	7.1	6.0	63.1	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 38

5 Miles

Figure:

Zone 39 - Dover, Medfield, Millis, Norfold, Sharon and Walpole.

Zone 39 consists of the towns of Dover, Medfield, Millis, Norfolk, Sharon and Walpole. All these towns are low density, residential communities. The 1970 population in this zone is about 55,000. And the towns are growing at a brisk rate. The CTPS estimate of population for the towns in zone 39 by 1980 is 71,000.

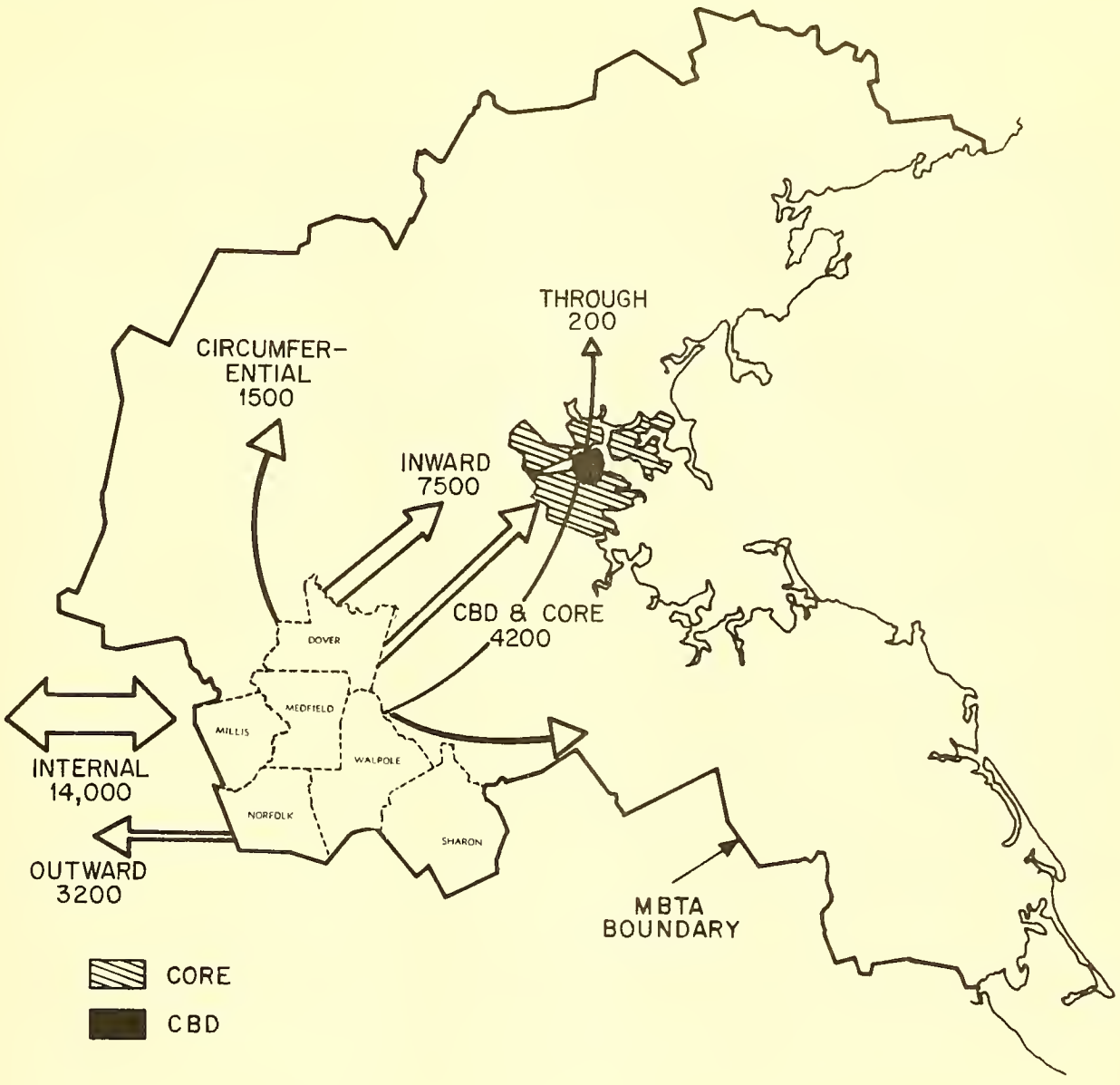
Dover and Medfield are high income, residential communitities. Dover and Norfolk are rural in character. Over 95% of the households in this zone own at least one automobile. And more than 50% of the households own more than one automobile.

Norfolk and Walpole are served by the Franklin Branch of the B&M Railroad. Sharon is served by the Providence Main Line of the B&M Railroad. The zone is also served by Route 109, Route 27 and Route 1A.

Forecasts for travel from zone 39 for 1980 show over 30,000 trips will be made during the A.M. peak period. About 46 percent of these trips are internal to the zone. Over 13 percent are to the core. Another 25 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Only 5 percent of the morning peak trips are circumferential, and over 10 percent are outward.

Of the morning trips to the core, about 50 percent are by transit. Trips with Boston CBD destinations represent about 62 percent of all trips to the core. About 56 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
DOVER	4,529	7,500	+65.3	296	8.2	$22,716	1.4	19.2	79.4
MEDFIELD	9,821	12,500	+27.2	576	7.1	$15,609	4.3	34.1	61.6
MILLIS	5,686	7,500	+31.9	464	7.1	$12,580	7.2	44.6	48.2
NORFOLK	4,656	5,500	+18.1	303	5.2	$12,105	6.8	38.5	54.7
SHARON	12,367	16,000	+29.3	509	6.6	$14,805	3.0	39.2	57.8
WALPOLE	18,149	21,900	+20.6	861	6.8	$12,828	5.8	52.6	41.6
TOTAL	55,208	70,900	+28.4	537	6.8	$14,576	4.9	42.6	52.5



TOTAL TRIPS 30,600

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	2,600	1,600	7,500	200	1,500	3,200	14,000	30,600
Percent of Total Peak Travel	8.5	5.2	24.5	0.6	4.9	10.5	45.8	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 39

5 Miles

Figure:

Zone 40 - Cohasset, Hingham, Hull, Scituate, and Weymouth

Zone 40 consists of the towns of Cohassett, Hingham, Hull, Scituate, and Weymouth. The CTPS estimate of population for the towns in zone 40 by 1980 is 120,000. Hull and Weymouth are moderate density residential communities. The other three towns are low density residential communities. All the towns in this zone are growing, according at a more rapid rate than the other towns.

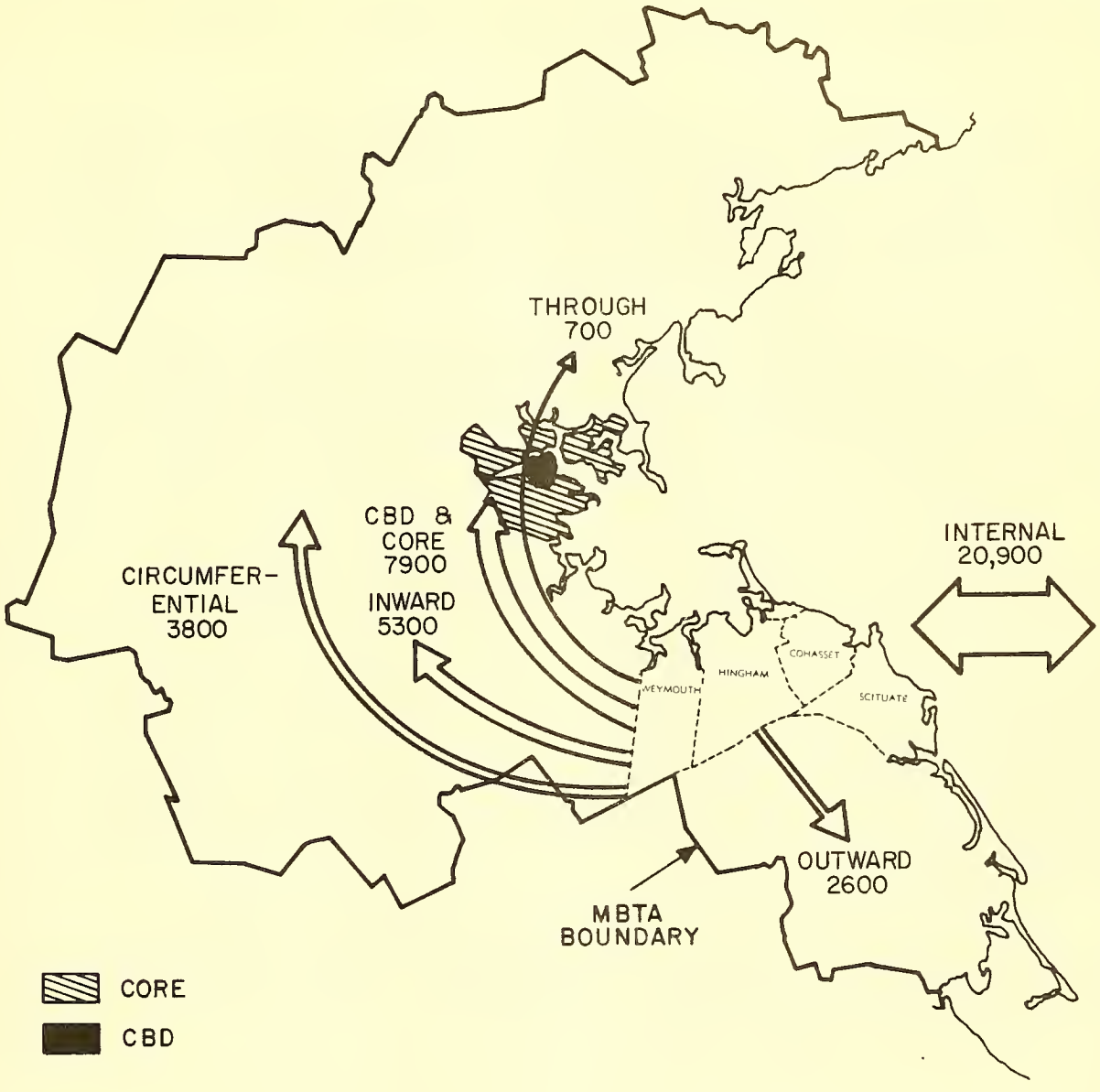
The residents of Cohasset, Hingham, and Scituate have a higher average median family income than the average median family income for the region. Hull and Weymouth have a median family income close to the average median family income for the region. Over 90 percent of the households in zone 40 own at least one automobile.

The zone is served by Route 3. The MBTA and private carriers operate bus service in the area. Some of these bus routes feed into MBTA Red Line stations.

Forecasts for travel from zone 40 for 1980 show over 41,000 trips made during the A.M. peak period. Over half of these trips are internal to the zone. About 20 percent are to the core. Another 15 percent of the A.M. trips are inward with a destination outside the core. Most of these trips have destinations before the core. Less than 10 percent of the morning peak trips are circumferential, and about 6 percent are outward.

Of the morning trips to the core, about 63 percent are by transit. Trips with Boston CBD destinations represent about 62 percent of all trips to the core. About 68 percent of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households None	One	Two or More
COHASSET	6,954	9,000	+29.4	691	9.5	$14,958	4.8	40.7	54.5
HINGHAM	18,845	21,000	+11.4	834	8.3	$14,202	6.1	43.2	50.7
HULL	9,961	11,000	+10.4	3,937	7.4	$10,677	12.2	54.1	33.7
SCITUATE	16,973	19,000	+11.9	994	7.6	$13,401	6.5	40.7	52.8
WEYMOUTH	54,610	58,500	+ 7.1	3,082	8.3	$11,631	8.6	52.6	38.8
TOTAL	107,343	118,500	+10.4	1,534	8.2	$12,522	8.0	46.6	45.4



TOTAL TRIPS 41,200

Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	4,900	3,000	5,300	700	3,800	2,600	20,900	41,200
Percent of Total Peak Travel	11.9	7.3	12.9	1.7	9.2	6.3	50.7	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 40

5 Miles

Figure:

Zone 41 - Duxbury, Hanover, Marshfield, Norwell, Pembroke, and Rockland.

Zone 41 consists of the towns of Duxbury, Hanover, Marshfield, Norwell, Pembroke, and Rockland. The population density in this zone is very low. All these towns are growing. Marshfield and Pembroke are growing at a more rapid rate than the other towns in the zone. The CTPS estimates of 1980 population for the towns in zone 41 is 90,000.

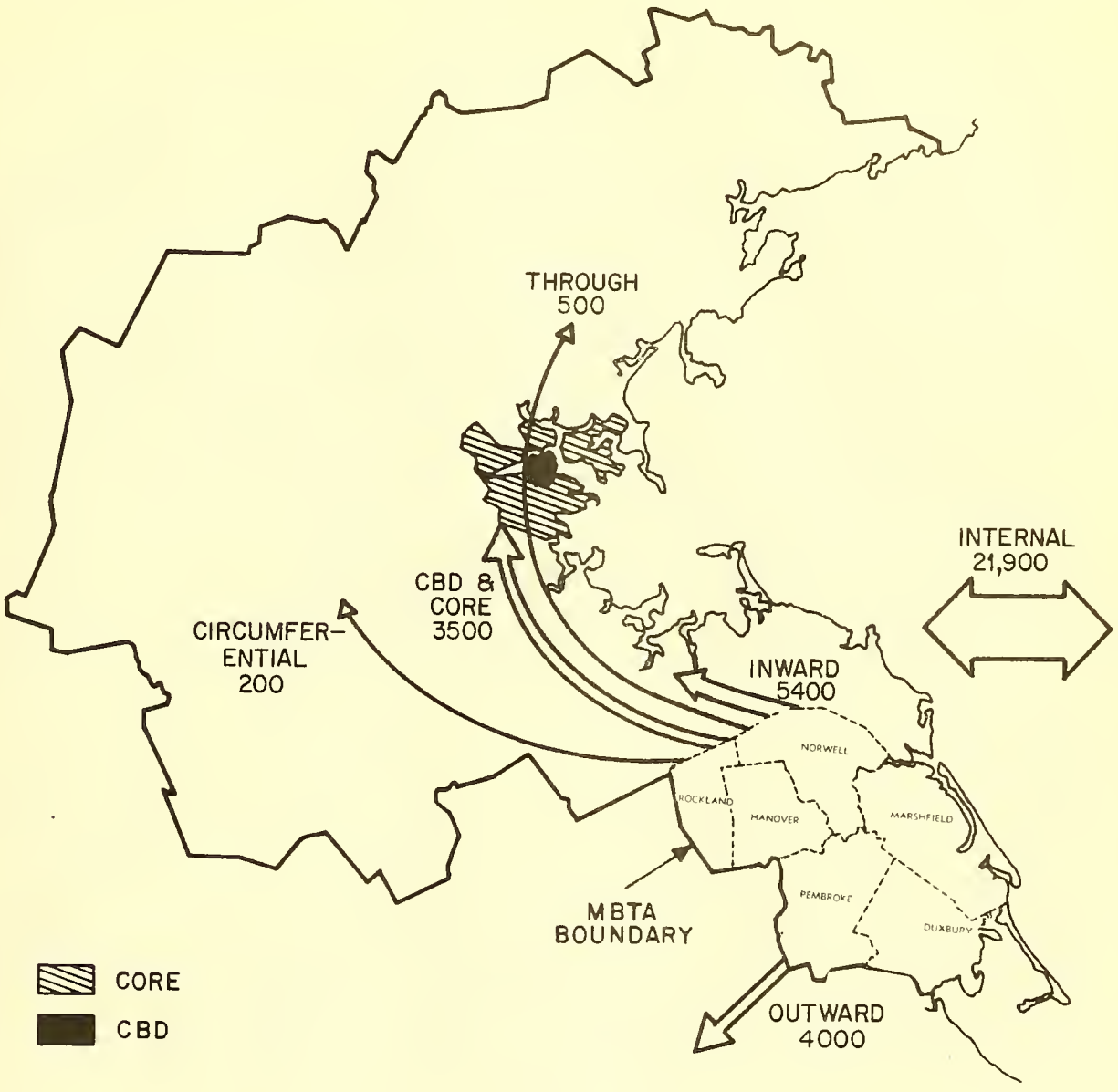
The average median family income for zone 41 is higher than the average median family income for the region. But, the average median family income for Pembroke and Rockland is lower than the average median family income for the region. Over 90 percent of the households in zone 41 have at least one automobile.

The zone is served by Route 3. The MBTA and private carriers offer bus service. Some of the bus routes feed into Red Line stations.

Forecasts for travel from zone 41 for 1980 show about 36,000 trips made during the A.M. peak period. Over 61 percent of these trips are internal to the zone. About 10 percent are to the core. Another 17 percent of the A.M. trips are inward and with a destination outside the core. Most of these trips have destinations before the core. Less than 1 percent of the morning peak trips are circumferential, and about 11 percent are outward.

Of the morning trips to the core, about 45 percent are by transit. Trips with Boston CBD destinations represent about 57 percent of all trips to the core. About half of the trips to the Boston CBD are by transit.

	1970 Pop.	1980 Est. Pop.	% Change	1970 Pop. Density (Pers./Sq. Mi.)	1970 % Elderly	1970 Median Income	1970 Automobiles Per Household (% of Households) None	One	Two or More
DUXBURY	7,636	9,500	+24.4	312	10.1	$13,523	5.1	38.1	56.8
HANOVER	10,107	12,500	+23.6	647	5.1	$13,071	4.0	40.9	56.9
MARSHFIELD	15,223	24,000	+57.6	534	10.2	$11,742	15.7	52.4	31.9
NORWELL	7,796	9,500	+21.3	365	9.5	$13,866	11.5	50.5	38.0
PEMBROKE	11,193	16,500	+47.4	481	5.4	$10,998	3.6	48.1	48.3
ROCKLAND	15,674	17,500	+11.6	155	9.0	$10,746	10.9	56.2	32.9
TOTAL	67,629	89,500	+32.3	548	8.3	$12,052	9.5	48.6	41.9



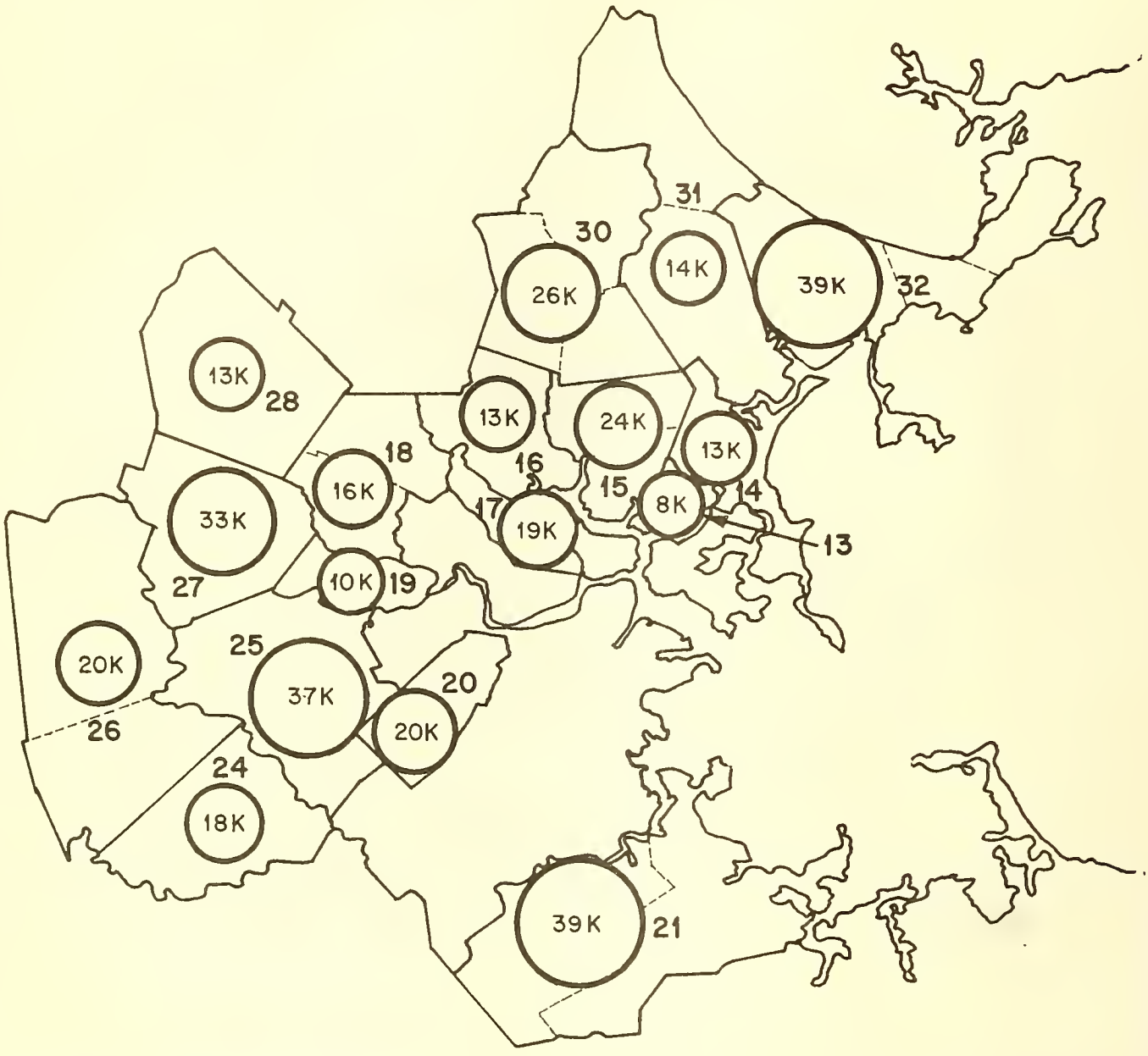
Direction/ Destination of Travel	To CBD	To Remainder of Core	Inward (not to Core)	Through Core	Circumferential	Outward	Internal	Total
Number of Trips	2,000	1,500	5,400	500	200	4,000	21,900	35,500
Percent of Total Peak Travel	5.6	4.2	15.2	1.4	0.6	11.3	61.7	100.0

1976 PMT

1980 A.M. PEAK PERIOD TRAVEL FROM ZONE 41

5 Miles

Figure:



CIRCLED NUMBERS DESIGNATE
NO. OF TRIPS IN THOUSANDS.
EXAMPLE: 12K = 12,000 TRIPS

ZONE NUMBERS ARE IN BOLDFACE.

1976 PMT	1980 A.M. PEAK PERIOD TRAVEL TO ZONES WITHIN 128	2 Miles Figure:

MORNING PEAK PERIOD TRAVEL TO ZONES WITHIN ROUTE 128

The map on the opposite page shows the 1980 A.M. peak period travel to zones (not including Boston or Cambridge zones) within route 128. The circled numbers designate number of trips in thousands. These trips include the travel to the zones from outside the zones and the internal trips.

The scale of each zone's employment activity is reflected in the level of tripmaking to that zone. Most of these trips are work trips. School trips represent a smaller portion of the morning travel to the zones than work trips represent. Four of the zones have each attracted more than 30,000 morning trips, according to CTPS estimates. These are zones 21, 25, 27, and 32.

Where a zone consists of more than one city or town, distribution of travel to the communities is not uniform. The vast majority to travel to zone 21 is to Quincy (31,000 out of 39,000 trips). Similary, the majority of travel to zone 32 is to Lynn (28,000 out of 39,000 trips).

The table on the following page presents information on the density of travel to zones. Density is measured in trips per square mile of land area. The density of travel to individual cities or towns within zones is also presented, where possible.

The zones comprising Somerville (17), Chelsea (13), and Brookline (20) have the largest densities of morning destinations of all zones listed in the table. The city of Lynn has a travel density greatly in excess of the overall density for the zone (32) that includes Lynn. Everett, Watertown, Arlington, Newton, Quincy, Winthrop, Waltham, and Malden also are projected to experience significant levels of density.

The information presented in the table has limitations. Density of travel destinations within a city or town is not uniformly distributed. This is because some of the zones contain large areas of residential and vacant lands. These areas do not attract trips. In spite of these limitations, the relative demands for morning travel to the zones within 128 are reflected by the statistics presented.

1980 A.M. PEAK PERIOD TRAVEL
TO ZONES WITHIN ROUTE 128

ZONE	COMMUNITY	LAND AREA (SQUARE MILE)	1980 A.M. TRIP (ESTIMATED)	TRAVEL DESTINATION DENSITY (TRIPS/SQ. MILE)
13	CHELSEA	1.86	7,900	4,270
14		7.51	12,600	1,680
	REVERE	(5.95)	(8,900)	(1,490)
	WINTHROP	(1.56)	(3,700)	(2,400)
15		8.44	23,800	2,810
	EVERETT	(3.36)	(11,100)	(3,290)
	MALDEN	(5.08)	(12,700)	(2,500)
16	MEDFORD	8.21	13,500	1,640
17	SOMERVILLE	3.93	18,500	4,710
18		9.77	16,100	1,650
	ARLINGTON	(5.18)	(9,900)	(1,910)
	BELMONT	(4.59)	(6,200)	(1,370)
19	WATERTOWN	4.06	10,300	2,550
20	BROOKLINE	6.62	19,700	2,980
21		29.61	39,400	1,330
	MILTON	(13.10)	(8,500)	(650)
	QUINCY	(16.51)	(30,900)	(1,870)
24	NEEDHAM	12.50	18,000	1,440
25	NEWTON	17.90	37,000	2,070
26		27.22	19,600	720
	WELLESLEY	(10.05)		
	WESTON	(17.17)		
27	WALTHAM	12.41	33,000	2,660
28	LEXINGTON	16.48	12,600	760
30		18.11	26,100	1,440
	MELROSE	(4.73)	(7,500)	(1,590)
	STONEHAM	(6.03)	(7,600)	(1,260)
	WAKEFIELD	(7.35)	(11,000)	(1,500)
31		20.80	13,500	650
	LYNNFIELD	(10.22)	(5,000)	(490)
	SAUGUS	(10.58)	(8,500)	(800)
32		18.99	39,100	2,060
	LYNN	(10.47)	(28,000)	(2,680)
	MARBLEHEAD	(4.40)	(6,300)	(1,430)
	NAHANT	(1.04)	(1,000)	(970)
	SWAMPSCOTT	(3.08)	(3,800)	(1,250)

APPENDIX I
ADJUSTMENT OF MODE SPLIT ESTIMATES

The result of the January 16, 1976 count of express bus riding showed that about 4,200 A.M. peak inbound riders use express bus services. Table 1 shows the breakdown of riders coming from different origins. There is a wide range of daily ridership levels between the six express bus routes serving the Western Corridor. The Riverside-to-Downtown route (300), the greatest daily ridership, attracts about 1,150 riders; the Watertown-to-Downtown (304) draws 1,000 riders; the Brighton Center route (301) has 850 riders; the Waltham route (305) draws 550 riders; the Watertown-to-Back Bay route (302) has 400 riders; and the Riverside-to-Back Bay route (303), the least daily ridership, has about 230 riders.

The morning peak period capacities on the lines are different. The capacities vary with service frequencies. Table 2 shows the headways of the express bus in the year 1976 and 1970. The Riverside-to-Downtown (300), Brighton Center-to-Downtown (301), and Watertown-to-Downtown (304) routes have high ridership levels during the A.M. peak period. Their respective headways are 5, 7, and 7 minutes. The Watertown-to-Back Bay route (302) has a 10 minute headway. The Riverside-to-Back Bay (303) and Waltham-to-Downtown (305) routes have the same headway - 15 minutes.

Table 3 shows the percentage breakdown of the A.M. peak express bus riders coming from different origins. The Riverside routes draw patrons from the greatest distance. The riders come from within a geographic area lying within a four mile radius of the Riverside terminal. Over half of the patrons come from Newton. The Watertown routes draw most heavily of their patrons from Newton and Watertown. The Brighton Center route, by contrast, draws almost exclusively from Brighton alone. All the patrons of the Waltham-to-Downtown route come from Waltham.

There are an estimated 1,350 express bus riders who are "new riders". Prior to using the express bus, these riders either did not travel or used an auto or train to make the trip. Table 4 shows the percentage of new ridership for each of the express bus routes. Thirty-three (33) percent of all express bus riders are "new riders". This statistic varies by route with 42 percent of all Riverside riders being newly attracted to the MBTA system and approximately one-third of all Watertown-Downtown and Watertown-Copley riders being new. The Waltham-Downtown route attracts about

TABLE 1 A.M. PEAK INBOUND RIDERS

TOWNS	RIVERSIDE-DOWNTOWN (300)	BRIGHTON-DOWNTOWN (301)	WATERTOWN-BACK BAY (302)	RIVERSIDE-BACK BAY (303)	WATERTOWN-DOWNTOWN (304)	WALTHAM-DOWNTOWN (305)	TOTAL
NEWTON	586		174	120	648		1,528
BRIGHTON		787	16		41		844
WATERTOWN		68	174		273		515
WALTHAM	23			5		547	575
WELLESLEY	172			35	10		217
NATICK	57			12	10		79
WESTON	69		10	14	10		103
WAYLAND	46			10			56
FRAMINGHAM	57			12			69
NEEDHAM	57			12	10		79
SUDBURY	12		10	2			24
SHERBORN	12			2			14
DOVER	23			5			28
BELMONT			4		10		14
LINCOLN			4				4
BEDFORD-CONCORD	12		4	2			18
LEXINGTON-WESTWOOD	12			2			14
ASHLAND	11			2			13
LINE VOLUMES	1,149	855	396	235	1,012	547	4,194

TABLE 2 INBOUND FREQUENCY (MINUTES)

YEAR		RIVERSIDE-DOWNTOWN (300)	BRIGHTON-DOWNTOWN (301)	WATERTOWN-BACK BAY (302)	RIVERSIDE-BACK BAY (303)	WATERTOWN-DOWNTOWN (304)	WALTHAM-DOWNTOWN (305)
1976	AM PEAK	5	7	10	15	7	15
	PM PEAK	4	10	12	17	5	20
	AM BASE	-	-	-	-	15	-
	2-4 PM	15	-	-	-	12	-
1970	AM PEAK	10	12	13	-	3	-
	PM PEAK	15	12	13	-	3	-
	OFF PEAK	-	-	-	-	15-20	-

TABLE 3 PERCENTAGE (TOTAL INBOUND A.M. PEAK RIDERS)

TOWNS	RIVERSIDE-DOWNTOWN (300)	BRIGHTON-DOWNTOWN (301)	WATERTOWN-BACK BAY (302)	RIVERSIDE-BACK BAY (303)	WATERTOWN-DOWNTOWN (304)	WALTHAM-DOWNTOWN (305)	TOTAL
NEWTON	51%		44%	51%	64%		36%
BRIGHTON		92%	4%		4%		20%
WATERTOWN		8%	44%		27%		12%
WALTHAM	2%			2%		100%	14%
WELLESLEY	15%			15%	1%		5%
NATICK	5%			5%	1%		2%
WESTON	6%		2.5%	6%	1%		2%
WAYLAND	4%			4%			1%
FRAMINGHAM	5%			5%			2%
NEEDHAM	5%			5%	1%		2%
SUDBURY	1%		2.5%	1%			
SHERBORN	1%			1%			
DOVER	2%			2%			
BELMONT			1%		1%		4%
LINCOLN			1%				
BEDFORD-CONCORD	1%		1%	1%			
LEXINGTON-WESTWOOD	1%			1%			
ASHLAND	1%			1%			
LINE VOLUMES	1,149	855	396	235	1,012	547	4,194

TABLE 4 NEW A.M. PEAK RIDERS

TOWNS	RIVERSIDE-DOWNTOWN (300)	BRIGHTON-DOWNTOWN (301)	WATERTOWN-BACK BAY (302)	RIVERSIDE-BACK BAY (303)	WATERTOWN-DOWNTOWN (304)	WALTHAM-DOWNTOWN (305)	TOTAL
NEWTON	246		58	50	219		573
BRIGHTON		118	6		13		137
WATERTOWN		10	58		92		160
WALTHAM	10			2		181	193
WELLESLEY	72			15	4		91
NATICK	24			5	4		33
WESTON	29		3	6	4		42
WAYLAND	19			4			23
FRAMINGHAM	24			5			29
NEEDHAM	24			5	4		33
SUDBURY	5		3	1			9
SHERBORN	5			1			6
DOVER	10			2			12
BELMONT			1		4		5
LINCOLN			1				1
BEDFORD-CONCORD	5		1	1			7
LEXINGTON-WESTWOOD	5			1			6
ASHLAND	5			1			6
LINE VOLUMES	483	128	131	99	344	181	1,366
PERCENT OF NEW RIDERS	42%	15%	33%	42%	33%	34%	33%

34 percent "new riders". The Brighton Center route attracts the least (15%) "new ridership".

A breakdown of the origins of these riders is shown in Table 4. These estimates are based upon 1970 survey responses for express bus riders, as reported in the MBTA publication, "Express Bus Report" (in house publication, March, 1970). In order to determine 1980 mode splits that assume express bus services to communities in the Western Corridor, it is assumed that about one-half of the "new riders" from Newton were former commuter rail users. The other half of the Newton riders are former auto users. It is also assumed that all the "new riders" of the other towns were formerly auto drivers or auto passengers.

Table 5 shows the original estimates of the mode split and the adjusted mode splits, which result from calculation of new transit trips to the Boston CBD on express bus services. The old and the new splits are presented only for those zones where the new transit ridership (shown in Table 4) is large enough to necessitate a new calculation of mode split.

The new mode split to the CBD exceeds the old mode split by as much as 8 percent - in the case of Waltham. There is no change assumed for mode split to the zones in the core outside the Boston CBD. The new mode splits, if calculated for the entire core, exceed the old splits by as much as 4.4 percent - in the case of zone 26 (Wellesley and Weston).

TABLE 5

ZONE	TOWNS	OLD MODE SPLIT TO CBD	OLD MODE SPLIT TO REMAINDER OF CORE	OLD MODE SPLIT TO CORE	NEW MODE SPLIT TO CBD	NEW MODE SPLIT TO REMAINDER OF CORE	NEW MODE SPLIT TO CORE
25	NEWTON	60.6%	47.7%	54.9%	65.3%	47.7%	57.5%
7	BRIGHTON	66.7%	57.1%	61.8%	69.3%	57.1%	63.1%
19	WATERTOWN	53.1%	50.4%	51.6%	61.1%	50.4%	55.0%
27	WALTHAM	65.0%	55.1%	59.3%	73.0%	55.1%	62.8%
26	WELLESLEY AND WESTON	53.5%	40.6%	47.9%	61.3%	40.6%	52.3%

2019 46